

ARMED FORCES

ARMY • NAVY
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 MARINES

MANAGEMENT



Feature

*Management Improvement
and Practices of the
Navy Bureau of Aeronautics
by Rear Admiral Russell*

Departments

- What's New in Suggestions?
- Washington Management
- Conservation Thoughts
- Service Schools
- News Briefs from the Services
- Book Reviews
- Letters to the Editor
- News and Activities of Armed Forces Management Association
- Cost-Cutting Products

On The Cover

This month on the cover we salute Rear Admiral J. S. Russell, USN, who succeeds Rear Admiral Soucek as Chief of the Navy Bureau of Aeronautics, and whose excellent performance of duty has earned him the Legion of Merit, the Distinguished Flying Cross, the Air Medal, and the Navy Gallantry Citation.

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Vol. 1, No. 8 May, 1955
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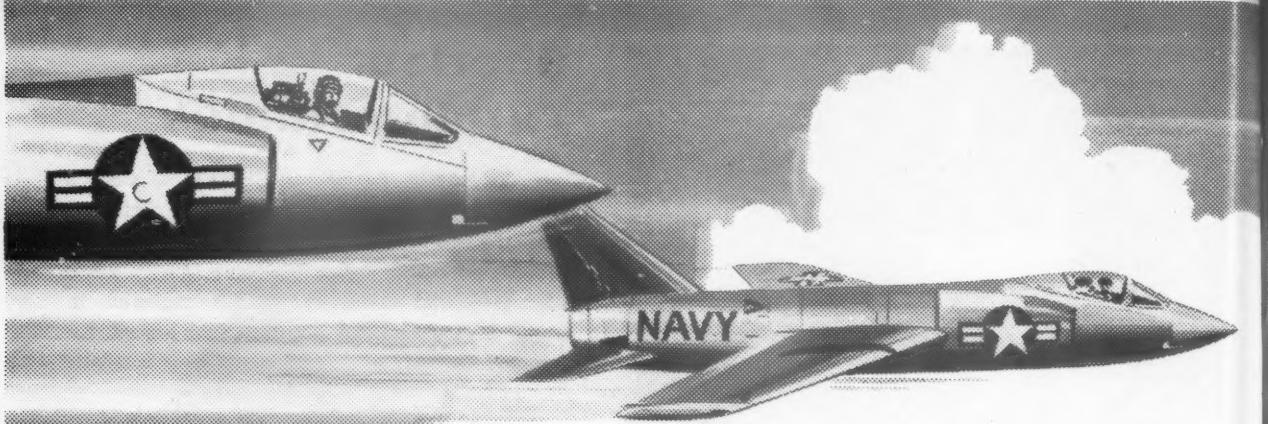
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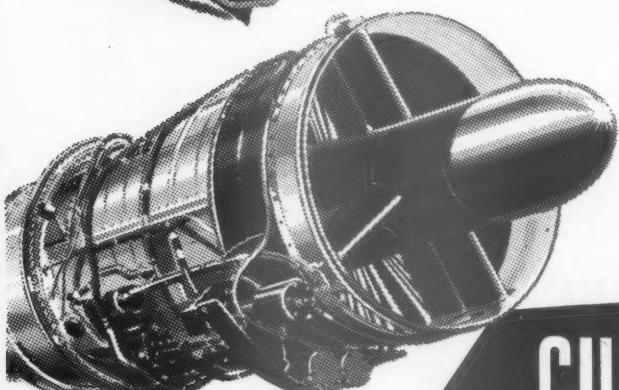
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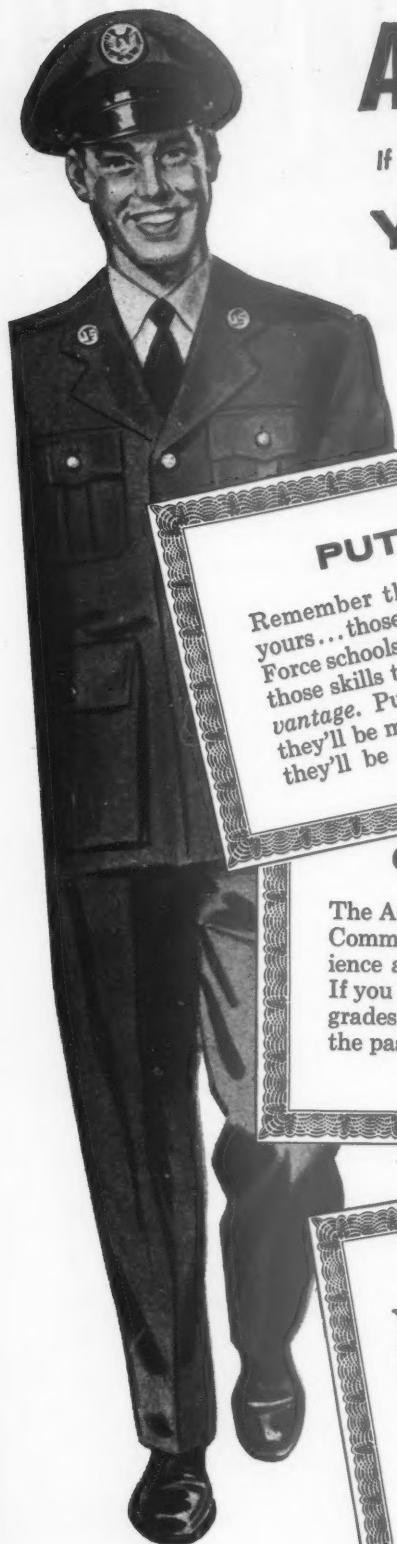
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ARMED FORCES MANAGEMENT

Management Improvement and Practices of The Navy Bureau of Aeronautics

by

Rear Admiral J. S. Russell, USN
Chief of the Bureau of Aeronautics



AT THE OUTSET, the reader should recognize that the Bureau of Aeronautics, in Washington, D. C., is a relatively small segment of the Department of the Navy. This bureau, with some 1750 civilian employees and 500 naval officers, or a total of about 2250 personnel, is a headquarters staff for a much larger naval aeronautical shore establishment.

Mission and Background

Broadly, the Bureau of Aeronautics is responsible for design, development, procurement, production, test, fitting out, maintenance, alteration, repair, and material effectiveness of Navy and Marine Corps aircraft (heavier-than-air and lighter-than-air), target drones, and certain guided missiles, including components and equipment thereof, launching and arresting equipment, and photographic and aerological equipment; the research therein; and all pertinent functions relating thereto.

It is responsible for contracting for naval aircraft, and for aviation equipment of a technical specialized nature; provides plant facilities necessary to meet production programs; schedules, in accordance with requirements, production of naval aircraft and naval aviation equipment, and assists manufacturers in the production thereof, to the end that the various items may be delivered in the quantities, of the qualities, and at the times required; collaborates with the Bureau of Yards and Docks in the design, construction, and alteration of all aeronautic shore establishments; advises the Bureau of Ships concerning aeronautical features and facilities in naval vessels for the operation of aircraft, guided missiles, and target drones; initially outfit and thereafter replenishes with aeronautical equipment and material all bases afloat and ashore from which naval aircraft operate.

It also supervises the service, repair, overhaul, and salvage of naval aircraft and aviation equipment; redistributes government-owned material, and settles contract termination claims under its cognizance.

The Bureau of Aeronautics was established by Act of Congress on 12 July 1921. Since then, this bureau's organization has been in constant evolution to adapt itself to the changing demands of Naval Aviation.

Beginning about 1940 and until mid 1945, the organization expanded greatly to meet the needs of Naval Aviation in World War II. With demobilization, the organization contracted to a size and pattern adapted to post-war needs. Events in Korea beginning in late June, 1950, required expansion once again. The increasingly tense international situation caused many mothballed aircraft to be reactivated and modernized, procurement of naval aircraft, guided missiles, target drones, and related aeronautical equipment to be greatly accelerated, and many air stations to be reactivated and expanded.

How BuAer is Organized

The present pattern of organization, established by the Bureau of Aeronautics Post-War Organization Planning Board in October 1945, reflects accepted Government and business practice. Bureau organization is divided into three levels: (1) the top administrative level represented by the Chief and the Deputy and Assistant Chief, and including staff divisions; (2) the Assistant Chief for Research and Development and the Assistant Chief for Materiel and Services; (3) the operating or line divisions which report to their Assistant Chiefs. Staff divisions which serve the entire Bureau are the Plans Coordination, Aircraft Logistics, Comptroller, Personnel, and Office Services Divisions; all others are line divisions except four of the divisions under the Assistant Chief for Research and Development (Experimental Program, Research, Evaluation, and Technical Data Divisions) which serve primarily in a staff capacity to the other line divisions engaged in research and development.

The Chief of the Bureau of Aeronautics, as a Naval Technical Assistant to the Secretary of the Navy, is directly responsible to him for supervision and administration. For business and logistic administration, the Chief of the Bureau of Aeronautics is responsible to the Civilian Executive Assistants of the Secretary of the Navy. For naval and logistic command, the Chief of the Bureau of Aeronautics is responsible to the Chief of Naval Operations who is the Secretary of the Navy's Naval Command Assistant. Under the Chief

(Continued on page 28)

Education for Technical Management at Cornell

by Andrew Schultz, Jr., Professor and Head,
Department of Industrial and Engineering Administration,
Sibley School of Mechanical Engineering, Cornell University

PERHAPS the most dynamic and rapidly developing field of study in the United States today is that of scientific management, although few use that name to describe it. The activity in the area exceeds that of fifty years ago when Taylor's scientific management movement was at its zenith, but is of a fundamentally different type in that the approach is more truly scientific by today's standards than was the work of Taylor's early successors. Engineers, mathematicians, statisticians, psychologists, social and political scientists, and members of many other disciplines are represented in the ranks of those devoting a majority of their time to study and research in the area, much of it sponsored by the Armed Forces. The creation of The Operations Research Society of America, of the American Institute of Industrial Engineers, of the Institute of Management Sciences, and of their associated journals bears on these developments. In addition, numerous sessions of other technical associations have been devoted to topics which are directly related to management problems. As in all fast developing areas of science, there exists a real problem in the rationalization and evaluation of the developments so that they may be most effectively absorbed by the educational processes on the one hand and the ultimate practitioners on the other. It is to be hoped that the lag of over 20 years in the general introduction of Taylor's ideas into the educational process will not be repeated in the modern instance. The following paragraphs attempt to evaluate the situation and outline the progress of one College at Cornell University and the direction it is taking toward education for modern technical management.



MODERN MANAGEMENT TRENDS

Modern management trends are carrying beyond the analytical methods introduced so successfully by the early industrial engineers and relatively recently further advanced by developments in the field of mathematical statistics. With the availability of modern electronic data handling machines and high speed electronic digital computers it becomes possible to perform rapid calculations previously too time-consuming to undertake. In addition, the equipment can collect economically the data necessary for such calculations. These developments make feasible in many cases the handling of the complex relationships found in modern management problems once these relationships can be stated in some objective form. When stated mathematically a process of optimization or maximization can be performed and the way toward better decisions indicated. A final step in this progression involves the synthesis of complex organizations in a more objective fashion than hitherto has been possible. The evaluation of the effectiveness of the design for the purpose of definition of controls is a last step in the solution.

In short, it will soon be possible to analyze an organization, express its purpose in terms of an objective function, then by means of computers determine the inter-relationships of this mathematical expression, and ultimately synthesize a design that is most effective within stated limitations in achieving the organizational objectives.

A contrast of this ultimate procedure with current enlightened management practice is perhaps in order. Today's procedure contemplates the development of some sort of performance objective, frequently termed a standard, based either upon an engineer's study of the operation or upon past achievement. Subsequent performance is compared with the standard or objective in detail and in total. Deviations which are indicated to be excessive are then studied either for the purpose of initiating corrective action or of indicating areas where further study is essential. There is inherent in such a procedure no implication of optimal performance nor any basis for developing means of synthesizing organizations or procedures which lead to such performance.

Progress from the current procedures to those which embody the more modern managerial concepts involves a number of developments and trends. One of these is the culmination of a quarter-century of growth in the development of cost computational techniques to the point where cost data in great detail are generally available and generally understood. This has progressed to the point where cost classification and collection procedures are readily adaptable to the needs of modern management provided that the data can be handled economically. A second development is the rational recording of performance data, and great

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progress has been made in the direction of recording and control instrumentation in production processes. A third development is the widespread ability to recognize, comprehend, and quantify probabilistic variation, perhaps best illustrated by the statistical procedures used in many quality control operations. In addition, a strong trend of over three decades, just recently glamourized and dignified by its own title—automation—has been the increasing integration of production operations. This has been made economical by high volume and recognition of the economy of design standardization and product layout. It has been made possible by automatic mechanical and electrical handling and control devices. This progress has resulted in the conversion of most of the production and some of the distribution plants or warehouses into what are essentially large complex machines with many elements and with resultant problems of planning, integration and control.

MODERN MANAGEMENT TECHNIQUES

In addition to those developments mentioned above there have been more recent ones which either already have resulted in new techniques or will soon require the development of new detailed techniques. Already mentioned is the development of practicable high speed data handling and computational systems which not only call for a complete reappraisal of current accounting, planning and control procedures, but open broad new vistas to those responsible for analysis, planning and control. When these systems are combined with the newly developed automatic control devices, the probabilities of the mechanization of the process of control are great. Some examples of specific techniques and theories are worth mentioning. The development of conceptions of mathematical programming and related computational procedures have made possible an optimal application to many problems which are inherent in today's multipurpose producing and distributing organizations. With the availability of the proper types of cost and performance data, rapid calculations can provide an-

svers which permit great economy in shipping and manufacturing planning. Refinement of data processing and computational equipment will soon make available relatively cheap systems for more specialized uses.

Recently much attention has been given to the problem of development of optimal inventory planning procedures, and it appears that the scheduling problem will also yield eventually to these attacks. Each of these developments in turn uncovers new problems and new methods of solution, and when these are combined with such proven conceptions as statistical control, great possibilities exist.

Study reveals that implementation of many of these new ideas and their resultant procedures cuts across present organizational lines, and requires major changes in the training and abilities needed in some individual positions in the organization. The problem of line management will increasingly involve comprehension of very complex production or procedural systems. Perhaps an analogy here might be the situation of the naval line officer who found at the start of World War II that, for all practical purposes, the operation of his command was in the hands of a communications officer locked up in the control center. The controller over the next decade is also going to be forced to deal with different cost conceptions, with complex equipment, and with extremely involved calculations. The problem of the synthesis of a manufacturing facility or a procedure will demand the highest competence,

and once completed, successful operation may hinge upon the effectiveness of maintenance procedures. The trend towards higher volumes, greater speeds, and more automation will demand better decisions. Only a few years ago decisions by an engineer or a manager could be evaluated in operations, and those found to be erroneous corrected at a relatively low cost. In the future the cost of an error will be much greater, and a correspondingly greater effort to make correct decisions will be justified.

One method for absorbing these new conceptions, procedures, and techniques in an organization might be the creation of a series of staff or "assistant-to" positions to be filled by highly technically trained individuals. Perhaps this could occur, but our business history does not indicate that management which must blindly and ignorantly follow technical recommendations will long survive. It seems far more logical to assume that one of the requirements for management of technical enterprise or complex operations will be at least the ability to comprehend, criticize, and evaluate these highly technical conceptions and procedures. Hence, a seriously changed demand as far as educational background is concerned can be foreseen.

THE EDUCATIONAL PROBLEM

There seems no doubt that just as the key operator in the plant of the future will be the highly skilled maintenance mechanic who will be relied upon to keep the process in operation, so will the manager of the future be highly trained and skilled in dealing with the complex production and operating procedures. Some sort of educational evolution is essential in order to produce this man. Just as equipment becomes obsolete rapidly in such a dynamic situation, so will personnel whose training is limited to mere technique.

As far as undergraduate education is concerned, the current answer to this problem at Cornell is found for engineering students in the Department of Industrial and Engineering Administration of the Sibley School of Mechanical

(Continued on page 26)

● The Navy is brightening up its combat planes, not to show them off, but to hide them. A new paint scheme, which has proven to be a better camouflage than the traditional dark blue, has been ordered for all Navy and Marine planes.

Combat aircraft will be painted a combination of glossy white and "gull" gray while helicopters will be painted light gray. Patrol craft will be painted a semi-gloss "seaplane" gray. Planes now in service will be given the new look at their next overhaul period after July 1.

MANAGEMENT WITH SEA LEGS

(AB)
Captain Ahroon discusses the very practical problems
of efficient management on a Navy aircraft carrier
(AB)

by
Captain T. A. Ahroon, USN
Director, Arament Division
Bureau of Aeronautics
Navy Department
Washington, D. C.

IT IS interesting to compare management as practiced ashore, particularly in the Navy, with the management of a large aircraft carrier. In stepping from command of the U.S.S. LYTE to the task of directing research and development of aircraft armament for the Bureau of Aeronautics, I, at first, thought there was little in common between management ashore and management with sea legs.

Actually, the basic principles of organization and management are so axiomatic that they apply, and are applied, just as firmly on board ship as they are in industry or in a government agency. The commanding officer of a ship hews closely to the line that every man must have clear-cut responsibilities or a definite job, such assignment being accompanied with adequate authority or the proper tools for execution; that a man should have only one clearly designated boss; that there is a chain of command and its echelons should not be bypassed; that production workers as well as ex-



ecutives should be told what to do and not how to do it; that responsibilities must be assigned, assumed, and practiced in the process of training and increasing the stature and decision-making ability of subordinates; and—most important—that good earthly Leadership is more often than not decisive in achieving effectiveness.

Yet the environment at sea is so different, the missions and tasks of a ship and her company so varying in nature, that shipboard organization appears bewildering to the novice, and seagoing management takes on a number of specialized facets.

Marching in Tune to Regulations

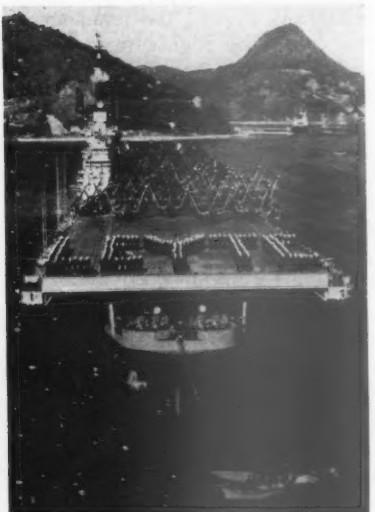
At this point I am sure someone will say that the Navy marches in tune to regulations and that such matters are to a large degree taken out of the hands of the skipper. I do not agree. I do not go as far as some and say that regulations are made only to be broken, but I do say that they are in effect mostly guidance. Most definitely, they do not make decisions for you nor do they assist much in making decisions.

Seven years ago *Navy Regulations* was modernized and put in

proper perspective. Previously it was a hodgepodge of orders and both managerial and technical instructions, but now *Navy Regulations* is confined chiefly to setting forth the authority of key positions and delineating their responsibilities, outlining certain procedures, and stating matters of discipline and protocol that are indigenous to the Navy. The Navy, or even a small unit thereof, cannot receive adequate guidance from a "bible" of 308 pages; and, at worst, such a "bible" alone would be open to much varying interpretation. Stemming from the *Regulations* is authority for all commands to issue additional informative and binding regulations and instructions which strongly affect management as it is practiced in the Navy and which are worthy of discussion.

First of all, the guide lines under which the skipper of a ship operates are exceptionally voluminous. They cannot be criticized solely on quantity. In effect they are a series of reference books, teaching and guiding the inexperienced, assisting the experienced through countless numbers of novel and strange situations, insuring the proper care and operation of public property, encouraging officers in proper deportment as servants of the People, and interpreting or extending the statutes, codes, laws, and even mores which guide the Public.

I remember when one of my own instructions had telling effect. It was an order to a Marine sentry to release the prisoners in the brig in event of a disaster. In this instance, when the catapult (used to launch aircraft from the carrier) exploded, release of the prisoners permitted them to take cover from the fire and gases so that they were eventually rescued unconscious but alive. I remember on the same occasion how I was assisted by a Bureau of Naval Personnel Instruction which gave the exact format for official death notices to the next of kin of 37 who died. The format looked un-



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necessarily harsh at that time, but subsequent events proved that the long-continuing experience of the Bureau of Naval Personnel in such matters was far better than my own judgment would have been. My personal telegrams were confined to condolences.

From the viewpoint not only of an organizational purist but also an industrialist who looks upon everybody's paperwork but his own as red tape, some Navy instructions and regulations are open to criticism because they tell not only *what* to do but also *how* to do it. To the experienced captain of a ship this situation is not intolerable. He knows that he is being told to steer his ship in the channel and not along the beach; he knows that his compatriots ashore are currently better versed in public, political, international, and economic aspects than he is; he knows that he needs merely write a letter to get instructions changed if he has a better idea; and, most important, he knows that he can at any time

decide and do as he thinks best—subject of course to subsequent justification.

I can say for myself, and I think for most other skippers, that at no time did I ever feel hamstrung by regulations and instructions. This feeling was fostered by commands and orders of the admirals for whom I operated. Except for formal operation orders, which are promulgated with a minimum of instructions to keep all units in step, I did not receive a single order as captain of the LYTE which told me *how* to do anything. In a previous command I sailed with two destroyers for a 43-day mission to the South Seas. My own operation order stated my intentions with enough clarity so that orders from my superior consisted of the one word, "Sail."

With this feeling of not being hamstrung, with this vote of confidence, I attempted to reflect the same management effort downward. Through many extensive evolutions and a number of crises in

which I might well have lost the ship, my officers and men never let me down on that cruise.

Governing Management Concept of the Navy

Thus the most important governing concept in the management of a ship of the Navy is, "The Captain knows that he can at any time decide and do as he thinks best." I think this statement, although it is qualified by "subject, or course, to subsequent justification" best illustrates the unparalleled degree of authority vested in the captain of a naval ship. It also suggests the tremendous responsibilities of command which require commensurate authority. The commanding officer as a manager can conceivably let his unit become disorganized, disinterested, and untrained—and consequently ineffective. The same might happen with a business manager, but in both instances corrective measures will overtake them.

The close-to-absolute authority given to a captain of a vessel is necessitated by his ship's being operational; thus, she and the man in command are constantly faced with dynamic situations. Not only is a carrier a massive, dangerous, and highly complex machine manned by men of even greater complexity, but also her environment, not to mention her mission, is hazardous. She is not static. In the midst of her hazardous and sometime treacherous environment she is either faced with dangerous situations or she often seeks out and meets those dynamic situations. These challenges, some of which can never be planned ahead, call for immediate decisions, the authority to carry out one's decisions and, furthermore, a continuing broad authority which will permit a captain to take every practicable step to maintain the capabilities of his ship.

The MB-1 can hold the aircraft just off the ground so that mechanics can study the functioning of the gear as it is raised and lowered under simulated flight conditions.

Mobility under load is one of its outstanding features. Even the heaviest planes are readily lifted, hauled and placed on location without the aid of end jacks or outrigging lines. Its 325 horsepower engine, large eight foot tall, low pressure tires and 40-ton lifting capacity provide versatility which allows it to do its job in rolling soil and sand, as well as on hard surfaced runways.

The MB-1 is over 50 feet long and more than 13 feet wide. With the boom in an upright position it measures more than 35 feet high and extended, has a maximum reach of more than 30 feet. A 90 degree electric power steering system allows it to turn completely around in a space only 47 feet wide—less than its own length.

In keeping with the Navy's policy in the event of emergencies or disasters, the crane will stand ready to assist nearby police and fire departments as well as officials of local civilian airports.

Huge Mobile Crane Unveiled by Navy

The Navy's MB-1 mobile crane, able to pick up a four-engine airplane and walk away with it, made its public debut recently at a demonstration staged at Floyd Bennett Field Naval Air Station, New York.

The new crane, designed and built by the LeTourneau-Westinghouse Company of Peoria, Illinois, in cooperation with the Navy's Bureau of Aeronautics, is destined to play a vital role in aircraft handling operations at U.S. Naval Air Stations. A 48-ton giant, able to travel at speeds up to 40 miles per hour, it features controls so precise that it can gently raise or lower a weight of 80,000 lbs.

Safety is outstanding because all hoisting and boomerang operations are controlled by spring loaded brakes on the electric motors. Should the operator become confused, taking his hands off the controls will instantly halt the load smoothly and automatically.

Among the duties to which the crane will be assigned is lifting of planes for safety checking of hydraulic landing gear systems.

Though it may be seen that while the broad authority of a command at sea stems from its operational nature, much of this authority flows over into the field of administrative management. For example, in a matter of few hours—the time it takes to exchange dispatches—a commanding officer can have any officer he deems unfit or unqualified detached and off his ship. Lest this

(Continued on page 22)



AUTHORITY, RESPONSIBILITY, AND ACCOUNTABILITY

by Morehead Patterson
Chairman, American Machine and Foundry Company

organizational problems. The fact that our growth in both these respects was concentrated in the past five years denied us an opportunity to adjust slowly and to gradually evolve an organization adequate to handle our new situation. Our adjustment had to be made virtually overnight. We could not afford the luxury of trial and error.

Since 1948, we have purchased thirteen separate companies which now operate as subsidiaries of AMF. Each had its own management, each its own product. We did not purchase these companies as suppliers or as sub-contractors for the parent concern. We purchased them because each manufactured a product for which an established outside market existed—a market which we hoped not only to maintain but to expand.

In what manner and to what extent were we to integrate or to absorb these new diverse facilities?

Clearly there were advantages in economy and efficiency to be gained by some measure of joint operations and central control. Equally clearly, there were dangers in overdoing it. We wanted to avoid stultifying initiative and we wanted to give full rein to the creative efforts of specialists and individual "know how". And we wanted to make certain that our subsidiaries would be able to respond quickly to changing market conditions and to new opportunities.

We have followed two main management principles in our attempt to achieve the delicate balance between the delegation of authority and the maintenance of control:

First, throughout the company, we have attempted to define and interpret the functions to be performed. We have tried to set down clearly and unequivocally the specific jobs that need to be done and

then to match up people with those jobs. This is basic. The man must be found to match the job. The job must not be adjusted to match the man.

In establishing these jobs, we have attempted to set down in specific terms what the man is to do, what his exact areas of responsibility are and whom he reports to and through what channels. We have tried to give each man sufficient *authority* to perform his task and then to hold him *responsible* for the performance of his task through a sensible system of *accountability* to higher levels.

It is only common sense to recognize that we cannot hold a man responsible for performing a job unless we give him sufficient authority to carry out that job.

By the nature of our company and, I think, to an increasing extent in all large companies, this principle has led to very marked decentralization. We have given our subsidiaries a relatively free rein. In military terms, their tactful mission is to make profits. Each subsidiary head plans and forecasts his own operation and submits his operating budget for general review to company headquarters. Then, within the limits of that general review and approval, these become the measure of his performance and the instrument of his accountability.

Another basic management principle that we have followed at AMF is to distinguish between line and staff functions and to maintain that distinction to the maximum extent possible.

In accordance with this concept, we are dividing our overall company operation into two main parts: 1. *line* or company operations; the production of our industrial products, our Defense products and our consumer products, and 2. *staff* or

THE publisher of Armed Forces Management asked me to contribute an article on the management principles we use in operating our company, American Machine and Foundry. Although it is true that certain basic principles are employed by all large, successfully operated industrial concerns, it is equally true, I think, that we can learn most about those principles if we observe them in reference to specific company situations.

AMF is a highly diversified company which has grown twenty-eight fold in the past fifteen years. In 1939, our total sales were \$5 million. Last year our sales were \$140 million. Before World War II our entire production output was confined to special purpose machinery for the tobacco, bakery and textile industries. Today, we also manufacture bicycles, tricycles, home power tools, metal furniture, bowling alleys and bowling pins, tooth-type lock washers, electric relays, and small horsepower motors. In addition we manufacture a great number of Defense items for the Armed Forces including automatic gun loaders, radar antennae, jet-engine rings and tank-engine fans—and we are very active in the atomic energy field. In fact most of our developmental energies are now being devoted to defense projects.

The rapid growth that we have experienced and the wide variety of products that we have undertaken to produce have brought with them very real and very pressing

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Services; our technical services such as Engineering, Accounting, personnel, etc. The parallel between these and the Army's Corps of Engineers, Quartermaster and the G-1 is, of course, readily apparent.

Another principle is that we distinguish between chain of command and channels of communication. The head of the company is free to give commands direct to any level and to get information from any level. He does not have to use the regular chain of command or the full system of communications channels in either instance. The important thing is that after he does take action or establish policy, and that action has been confirmed, that it is brought back into the regular chain of command.

So much for principles. They are serving us in good stead at AMF. However, no less important are guiding *policies* of a company and several of these have been particularly important in shaping our operation.

First, of course, we are in business to make a profit. This is the measure of how good a job we are doing. But we have adopted a conscious policy of trying to make our long range profit through the tackling of *tough* jobs. We are devoting our research and development energies to working out the new, uncharted areas but, in all cases, our research and development is directed toward eventual production—and production by AMF. We are not a research or developmental company, we are a research-developmental-production company and all three adjectives are intertwined. We have a selfish motive in tackling the tough jobs. In defense, for example, we know that there have always been ups and downs in the production cycle. When declines come and retrenchment programs arrive, we want to be in the forefront of those contractors who maintain their sales volume. But we also believe that defense production is likely to be an important element in our economy for many decades and we are therefore allocating it a central and permanent place in our company structure.

A second policy is that we hire good men whenever and wherever we can find them, whether we need them at the specific moment or not.

We stockpile manpower on the assumption of the continued growth of our company and of our national economy.

Thirdly, we have no false pride of "authorship". We try to learn from our customers no less than our competitors. Only recently we began the adoption of the Fauche system of production analysis developed by the Navy. It wasn't the Navy's idea that we do this—we did it on our own initiative.

In our work for the Armed Services, we have instituted additional reporting to the government on the progress of our various projects. Here again, this has been a matter of initiative rather than compulsion. The reporting has served to

strengthen our internal systems of controls.

I hope that I have not given the impression that we have done all of the things we want to with respect to organization at AMF nor that we are fully satisfied with what we have accomplished in this relatively short period. What I do hope is that some of the readers of this magazine will sympathize with "the growing pains" that we have experienced and will profit from our efforts to deal with them. In a very real sense, the central problem of managing a twentieth century business enterprise is parallel to that faced by the leaders of a free society—to maintain an equilibrium between individual freedoms and central controls.



The following "OBJECTION CHECK LIST" was sent in by Major B. P. Fowler. Good ideas for management improvements have received these answers. How would you react to these obviously poor replies?

1—Oh, it would save only a dollar a week.

2—I'll send it to higher headquarters. It would help us at this level, but we can't give you an overall picture in evaluating the savings.

3-The idea is too revolutionary.

4-The comptroller is tough on our getting new ideas so let's keep peace in the family.

5-It would cost too much to do it now because

6-When a war comes, we will change the operation to speed the processing.

7-I've only a few months to go before (retirement or transfer) so I don't care about battling for a little savings.

8-It will effect the personnel who have to be shifted and we don't want to upset them, do we?

9-Headquarters must have con-

sidered this when they wrote the manual.

10—We can't expect top efficiency from men who don't want to be in the service.

11—Yes, we know we are over-staffed, but we must have trained men on hand. They transfer all your men and give you replacements two-months later.

12—The idea has merit, but I'm new around here, etc. . . .

13—To accomplish this idea would require a manual change, and if I send it on to higher headquarters and they don't like it, they'll think I'm stupid.

14—Yes, it's a good idea, but the Old Man doesn't want it.

15—It would take at least 10 years to simplify this and get it approved.

Nautical Mile Is Changed

Poor old Nat Bowditch is probably turning over in his grave. After some 160 years of accepting the nautical mile of 6080.2 feet as a standard distance of navigation, scientists have corrected it.

At the request of the International Standards Association, the Navy's Hydrographic Office arranged a meeting of the Armed Forces last year to discuss the problem.

This resulted in a decision to alter the prescribed 6080.2 feet to 6076.1033 feet or the 1852-meter standard used by all nations other than the United States and Britain.

Comptrollership at a Navy Field Activity

AB

by

Captain G. L. Countryman, USN

COMPTROLLERSHIP in a field activity is an extremely broad subject and to give a complete picture, we must include details of industrial fund operations. Before considering these details let us briefly discuss the broad concept of comptrollership as far as the Comptroller himself and his department are concerned.

Even though only a few activities have operated under the industrial fund for any length of time, it is apparent that in the military, as in business, an individual Comptroller can take one of two courses. He can move toward top management or he can move away from top management and tend to become specialized in only one phase, usually accounting.

In any activity, each department may be considered to some extent a "pressure group" with its own objectives in mind. In a Naval Shipyard these departments include Planning, Production, Supply, Public Works, etc. In a commercial concern, these same pressure groups exist. The production manager wants all equipment in operation 100% of the time whether there is a demand for the output or not. The sales manager wants all items which can be sold, (1) to be in stock in sufficient quantities to meet any demand, (2) priced under competition, and (3) would like unlimited credit extended to all customers. The credit manager does not want to accept an order from any customer who does not enjoy an AA-A1 rating. The activity commander is in somewhat the same position as the president of a large company. It is impossible for him to make sound decisions based solely on the representations of various "pressure groups." He needs planned objectives for each depart-



ment based on and contributing to the over-all planned objective for his activity. Obviously, it is difficult for one man to follow the progress of each department, make necessary adjustments, and reconcile differences to obtain the desired over-all objective.

Now, here is where the Comptroller can help, provided his thinking is related to the needs of top management rather than specialization. The Number One qualification for any Comptroller is that he must be a good administrator. He should be able to weigh various factors in the light of operations as a whole, arrive at sound conclusions and present his recommendations to the Commander in a factual and logical manner. A knowledge of accounting is important, but the Comptroller himself should know something about planning, production, human relations, law, budgeting, both at activity and Bureau level, military structure. In other words, he should have had wide military experience. Among his responsibilities are: (1) the cost of operating his Comptroller Depart-

ment, (2) the reports and services that he can render to local management, (3) the adequacy of internal controls, and (4) the proper financial reporting.

Even though the Comptroller may have excellent accounting competence, any tendency on his part to use his faculties for doing things himself and getting bogged down in technicalities rather than selecting good technicians to do the jobs will cause a decline in the effectiveness of the Comptroller Department. The Comptroller should hire good men, define their duties and responsibilities, say "Here is your job," and then let them operate within their field with a minimum of interference. With responsibility must go authority as well as accountability.

The Comptroller is supposed to serve management by providing it with the information that will enable the activity to do a better job, but frequently, the individuals in his Department are regarded by the people in management, particularly at a lower level, as a source of interference rather than assistance. The Comptroller, and when I use the term I refer, of course, to the entire Comptroller Department, must keep management advised as to where it stands in terms of variance between standards or goals, and actual performance. Through the records available from the Comptroller, errors, inconsistencies and weaknesses can be located.

Frequently, shop management feels that the figures furnished them, instead of presenting the situation as it is, only demonstrate that things are not the way they have been, or should be. To shop management the important thing is today, not yesterday or tomorrow. The Comptroller, with an eye to past or future performance, may tend to ignore the present because, of necessity, he must use the past or future to measure the present. This, in the eyes of shop management, is unrealistic and any tendency in this direction must be guarded against.

It appears that the question is—"Should the Comptroller (and again I include all employees of the Comptroller Department) be taught to think like shop supervisors or should shop supervisors be in-

structed in Comptrollership techniques?" The answer is that both should be done. A Comptroller with the proper background and experience will understand shop problems and can indoctrinate his department as necessary. Shop supervision must understand the Comptroller viewpoint. This can be handled by conferences, group discussions, education and indoctrination and by supplemental financial statements prepared in layman's language, which shop supervision at the lower levels can understand and use.

Conferences with shop supervision, however, can do more harm than good if any effort is made to keep them on a lofty plane, resulting in solemn and profound truths that nine times out of 10 will go in one ear of the conferee and out the other. Such conferences or group discussions are of value only if they result in specific detailed suggestions that can be used immediately. One important point is that these discussions must be attended by the individuals who can and will put into action the same ideas that they themselves have decided are workable.

An article by Dr. Welsch summarizes pretty well what I have been trying to put across. Dr. Welsch is a Certified Public Accountant as well as a Doctor of Philosophy. He is Professor of Accounting at the University of Texas and one of the outstanding authorities on accounting in the country today. The article, which appeared in THE JOURNAL OF ACCOUNTANCY, was entitled "The Controller's Function in Top-Level Management." He starts off his article by saying, "Controllership is basically a viewpoint, so the Controller must think first in terms of the basic functions of top management—have a "management viewpoint" rather than an "accounting viewpoint."

Later on in his article he says, "The Controller should be a staff executive who, in addition to having the primary function of assisting in the determination of top policies, has numerous subsidiary responsibilities such as the record-keeping function and budget supervision. The detail work connected with these subsidiary functions must BE DELEGATED TO SUBORDINATES, the controller utilizing his

time in the processes of management. The controller must turn from any preoccupation with accounting detail, delegating such tasks to his staff."

He concludes his article by the following statement: "Accounting is not the first concern of Comptrollership. It is one of the many parts of the controllership function. One who aspires to attain real controllership status cannot hide behind a series of neat columns and rows of figures. He must cease being a bookkeeper and become a businessman."

So much for the broad concepts. Now we will discuss details of Industrial Fund operations at a field activity and since Naval Shipyards are the largest single military industrial operation and my experience has been in Naval Shipyards, we will use them as an example.

COMPTROLLER DEPARTMENT ORGANIZATION

Industrial fund operations at a Naval Shipyard is more than just another system of accounting. Under the former appropriation accounting system the Fiscal Department at a Naval Shipyard "kept the books," kept employees' time, paid the employees, issued bonds, and accomplished other allied functions, all confined to the field of accounting.

The entire former Fiscal Department is retained in the new Comptroller organization, with some changes, as the Accounting and Disbursing Division. An expanded Cost Accounting Branch has been added, the General Accounting Branch has an increased scope of responsibilities and the source of operating funds is now the Industrial Fund of the Shipyard rather than funds re-

Heat Is On "Competition"

The government is expanding the drive to eliminate its commercial-type and industrial activities which compete with private business.

All departments and agencies, including the military, are preparing inventories of commercial-type activities.

The agencies also are making an evaluation of their manufacturing activities, and the deadline for these reports is July 15.

ceived directly from various appropriations.

In addition to this Accounting and Disbursing Division, there have been added, (1) the Internal Review Division for auditing and for the establishment of controls not only within the Comptroller Department, but throughout the Shipyard, (2) a Budget and Statistics Division whose primary function is to prepare annual and quarterly budgets formerly prepared in the MP&R Department under the Industrial Engineering Officer. Other important functions are to act as fund administrator for the Shipyard, and to maintain necessary statistical data. The third (3rd) Division that has been added is a separate Administrative Division to handle administrative matters for the Comptroller Department, including personnel, fixtures, space, fire prevention, security and other departmental administrative matters.

COMPARISON WITH APPROPRIATION ACCOUNTING

One basic difference between Appropriation Accounting and Industrial Fund operations is that accrual accounts are set up under NIF. These accrual accounts are established for all items that can be reasonably forecast over the period of a fiscal year and include amounts deemed necessary for major maintenance, for annual and sick leave, for various services, such as, utility costs, tank car rentals, overhaul of certain Yard craft, etc.

Under Appropriation Accounting, costs were paid for by many different appropriations whose books were kept separately and frequently at widely separated geographical points. The result was that the Shipyard used money from many different bank accounts with no coordinated control. Any accurate reckoning of the cost of, for example, a destroyer overhaul or a major conversion was impossible and never attempted except on a statistical basis. Because of this, prices were based on more or less crude estimates.

It is easy to contrast this with Industrial Fund operations under which all expenses (labor, material and overhead) are paid from a single fund which is replenished to

(Continued on page 18)



ARMED FORCES MANAGEMENT ASSOCIATION

NEWS and ACTIVITIES

HEADQUARTERS

AFMA President Weldon T. Ellis, Jr., participated as a member of the Panel on Organization, Methods, and Management of the American Society of Public Administration at their annual meeting in New York on 18 March 1955. The panel was chaired by William F. Howell, Dir. of Administration, International Bank for Reconstruction and Development. Other members were Donald Axelrod, Chief Examiner, Management Division of the Budget, New York State; and William J. Sheppard, Asst. to the Deputy Dir. for Management, Foreign Operations Administration.

Edmund D. Dwyer as a guest speaker before the Aberdeen Chap-

ter of AFMA gave an address on Paperwork Management.

Tom Kouzes has accepted a position as Assistant Director of Management Engineering Division, Bureau of Supplies and Accounts, Department of the Navy.

CHAPTER NEWS

The AFMA welcomed Senator Homer E. Capehart as a guest speaker before the INDIANA CHAPTER on Charter Presentation Night, 1 April 1955.

Congressman Richard E. Lankford, member of the House Armed Services Committee talked to the Management and Industrial Engineering Division of the National Capitol Chapter on 7 April 1955, on the Organization and Responsibilities of the Committee.

Brigadier General T. Alan Bennett, 11th Air Division Commander addressed the February meeting of the Sourdough Chapter, Anchorage, Alaska.

The AFMA greets three new chapters:

INFANTRY CENTER CHAPTER, Ft. Benning, Georgia, embracing Fort Benning, Georgia; Eastern Alabama and Western Georgia. Chairman is Major B. F. Hood.

RIO GRANDE CHAPTER, 3929 Pollard Street, El Paso, Texas. Communicate with Mr. Edward V. Blackmore. Active and Potential—White Sands Proving Ground; Biggs Air Force Base; Holloman Air Defense Center; Fort Bliss; and William Beaumont Army Hospital.

DETROIT CHAPTER, Temporary Chairman, Bernard Markofsky, 24031 Church Road, Oak Park 37, Michigan. Active and Potential—Detroit Arsenal; Detroit Ordnance District; Selfridge Air Base; Navy Coast Inspection; Air Force Procurement; Michigan Military District; Corps of Engineers, and Army Finance office.

Improvement of Financial Management in the Army

Carl Freedman

Management Engineer, Management Division
Office of the Comptroller of the Army
(Lt. Col. TC USAR)

"In time of Peace we have All the Time in the World and No Money—In Time of War, All the Money in the World and No Time." This statement is attributed to General George C. Marshall shortly after the outbreak of WW II. In our democracy, which abhors war and is dedicated to peace, this "feast and famine" philosophy has always plagued our military services. Nevertheless, it should be recognized as one of the principal "roadblocks" in the path to effective

financial management which has existed in the past. Though we regret it for other reasons, the advent of the "cold war" with its tremendous military budgets—to be with us for many years to come—provides an ideal base for an enlightened and comprehensive financial management program. It also provides a distinct challenge to responsible military and civilian personnel at all levels of management in the Army, to become more effective financial managers.

Need for Improved Financial Management

Why do we need improved financial management in the Army? Perhaps this question can best be answered by pointing to the size and complexity of the financial management job which faces the Army. Army inventories in the Continental United States are approximately \$16 billion. This compares with the total inventory in the U.S. retail trade of \$22 billion. Post, camp, and station issues (retail sales) in the U.S. run about \$135 million a month. In a Continental U.S. Army command we might find the following: Inventories, \$95 million; Operating Expenses (including estimated military personnel cost not funded to Army Commander) about \$750 million per year; Manpower, 143,000. Total Army expenditures in FY 1953 were about \$16 billion (16,000 million) as compared with \$270 million or almost 60 times what they were in 1934. Finally, how does the Army stack up with private industry? The following estimates for 1954 com-

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MAY,

pare the Army with three of the world's largest corporations:

| Manpower Gross Revenue | | |
|------------------------|-----------|---------|
| Army (FY 1954)..... | 1,800,000 | \$17.2* |
| AT & T..... | 700,000 | 4.5† |
| U. S. Steel..... | 276,000 | 3.3† |
| General Motors..... | 538,000 | 9.6† |

*Avail. for Oblig.

†Billion (sales)

In view of this tremendous management job, it seems obvious that the Army needs something more than a checkbook and bank statement to manage its financial affairs. The responsible commanders (managers) in the Army, who are faced with the management of this Goliath are entitled to the best systems of financing and administration which it is possible to devise. Certainly no businessman in a comparable situation would accept anything less. The experts both in and out of the Army uniformly agree that financial management practices in the Army—as in other government departments—have not kept pace with the growth of our operations. Some go so far as to say that our archaic financial procedures have not changed essentially since they were initiated by Alexander Hamilton.

Developments Leading to the Army's FMP

It will be recalled that the first Hoover Commission pointed up the need for improving financial management in the Department of Defense. This, together with other studies, resulted in the enactment of Public Law 216 by the 81st Congress in 1949. The stated purpose of the law was "to reorganize fiscal management in the National Military Establishment to promote efficiency and economy." Among other things the law provided for: (1) Comptrollers in the DOD and military departments, (2) Performance Budgeting and Accounting to measure the cost of functional programs and activities, and (3) Use of working capital (revolving) funds for financing industrial and commercial activities. Public Law 784 enacted by the same Congress provided for improvements in budgeting and accounting procedures.

It should be noted that the Army itself early recognized the need for improving the management of its financial affairs. Even before enactment of PL 216 in 1949, the Army had established a comptroller. One



Introducing Carl Freedman. He has served on the National Board of Directors of the Armed Forces Management Association since 1953 as Treasurer. During World War II Mr. Freedman served in the United States Army from June 1942 to December 1945. In his initial wartime assignment he assisted Brigadier General A. B. Warfield in the activation of the Holding and Reassignment Point at Lathrop, California, which is now the Sharpe General Depot. In this assignment he organized many of the support activities of the installation such as supply, fiscal, and post exchange. Subsequently, as a member of the staff of HQ Army Service Forces he participated in the planning for demobilization with specific responsi-

bility for developing policies and procedures pertaining to movement of personnel. Incident to this work, he developed the "Dual Stencil" procedure for movement rosters and was instrumental in promulgating the "Directional Flow" principle for movement of personnel to separation centers.

He left active military service in 1945 and spent five years with the Veterans Administration service as Assistant Director of Coordination and Planning for the Branch 12 Headquarters of the Veterans Administration which covered California, Arizona, Nevada and Hawaii. This included special assignments such as the planning for activation of the VA Insurance Office in Oakland, California and the direction of the reorganization and installation of new procedures in all regional offices in the area. Mr. Freedman was recalled to active duty in 1951 and served as Operations Officer, General Staff, with ACofS, G4, D/A; was released from active service in March 1953 and is currently active as a Lt. Colonel in the Army Reserves. He then joined the Office of the Comptroller of the Army as a management engineer where he is now assigned. In this assignment his principal concern is and has been with the Army's Financial Management Plan, the subject he has chosen for his article. Recently he coordinated the development of materials and, with a team personally directed by Lt. General George H. Decker, then Comptroller of the Army, conducted seminars on the Army's Financial Management Plan for the commanding generals and top staffs of the CONUS Armies and MDW.

of his principal tasks was to inaugurate improvements in financial management. The statute provided a legal basis for this new organizational entity. Following enactment of the law, the Army proceeded vigorously with the organizing of comptrollership at all levels of non-tactical command to provide the needed foundation for improved financial management. Further development of this effort was temporarily slowed down by the Korean War. However, the Korean episode itself served to highlight some of the weaknesses of our system. It is easy to recall the criticisms which were leveled at the Army, shortly after the beginning of the Korean War, for the shortages of ammunition and other supplies and equipment. Congress and the public wanted to know what had been done with the \$30 billion which had been appropriated for the Army since the end of WW II. The responsible officials in the Army knew, of course, that this money had gone principally

to pay the current operating costs for occupation of Germany and Japan and to maintain occupation and security forces around the world. Very little was available to build an operating base and mobilization reserve of materials and equipment for emergencies. Unfortunately, the Army's budgeting and accounting systems were not designed to produce easily understood facts and figures to show specifically for what the money and other resources were used.

With the termination of the Korean hostilities, the Army resumed its efforts to improve financial management. The continued external interest in this effort, including the OSD and various Congressional Committees, served to stimulate this effort and in August 1953 Army Regulation 37-5 was issued setting forth the Army's comprehensive program for improving financial management.

Objectives of the Financial Management Plan

The primary objective of the

Army FMP is to provide at all levels of command in the Army "better command control of resources and operations." This, of course, embraces improvement of our methods for presenting and justifying the resources required, the accounting and reporting on the status and utilization of such resources, and the status and cost of operations. By using the dollar as the common denominator, commanders will be provided in summary terms facts which have been available, in the past, only to the specialists.

Another major objective of the Army's Financial Management Plan is what might be termed the introduction and promotion of a "command/management philosophy." The goal here is to provide all military personnel with the requisite "know-how" in management of business affairs of the Army commensurate with the assignments they may expect during the course of their military careers. It is significant that General John E. Hull, Former Vice Chief of Staff, once observed that in the career of an Army Officer 50% of his time will be spent on business type assignments; yet the Army's school system has, in the past, devoted itself almost exclusively to military subjects. Steps have been taken in the Army to correct this situation both from the short-term and long-range viewpoints.

The means for the accomplishment of the preceding—which is in itself an important objective of the Army's Financial Management Plan—is the introduction of more modern business processes into the management of the Army's non-tactical operations, and to integrate such new procedures with other proven management controls which are retained. These processes must be tailored to fit the particular needs of Army management and not adopted simply because they were used elsewhere. The individual financial systems must be synchronized with each other, and should be compatible with the Army Programming process. It should be clearly recognized that Programming and Financial Management are two basic management processes for the managing of the Army's affairs which are comple-

mentary and interdependent. It should also be recognized that Programming and Financial Management are not panaceas which automatically remove the need for other management systems and techniques such as manpower control, performance analysis, production scheduling and control, item stock control and others. To the extent practical, however, these various management systems should have a common base for accounting and reporting to eliminate duplication of effort, to simplify the mechanical processes, and to reduce the burden on the field establishment.

Elements of the Financial Management Plan

Achievement of the objectives of the FMP is dependent upon the installation and operation of a number of new or revised systems and techniques. These are outlined briefly below:

1. Cost-of-Performance Budgeting

The Army currently operates under an obligation-type budget system. Therefore, the budget is used solely for obtaining and controlling obligation authority (funds)

for expenditure during a given fiscal period. The budget does not reveal the costs to be incurred or resources to be consumed. To meet the requirements of PL 216 as well as internal management needs, a cost-of-performance budget is to be designed and installed which will provide for projection and reporting of costs as well as funds in relation to Army missions, programs, and activities. The Army budget to Congress will be staff developed at the departmental level. Operating cost budgets (activity and installation) will be used as a basis for funding as well as for measuring the cost of work accomplished in relation to forecasts. In the past commanders have been given the means to measure efficiency and effectiveness in terms of quantity and quality. The cost-of-performance budget will provide a third dimension—cost.

2. Consumer Funding

Funds provided to installation commanders have in the past been limited to "out-of-pocket" expenses for civilian payrolls, local purchases and other items not furnished as free issue. Furthermore, logistics installations in the CONUS have received funds for mission costs and support activities through different channels. Consumer Funding policies under the FMP provide for funding the installation commander for all *controllable* costs insofar as practicable. (Costs not funded will be budgeted, accounted and reported statistically). Funds will be furnished through a single channel—the command channel. Greater flexibility is to be given commanders in the use of funds. When cost budgeting is a reality, it is planned to give commanders full authority to transfer funds between budget programs. Ultimately, it is the goal to provide each installation or major activity commander his funds by a single allotment for each appropriation.

3. Stock Funds

The Army Stock Fund is a working capital (revolving) fund. Under the FMP it is used to simplify and improve financing the procurement and management of inventories of common-use standard stock items. As an essential adjunct to the cost budget and consumer funding, it



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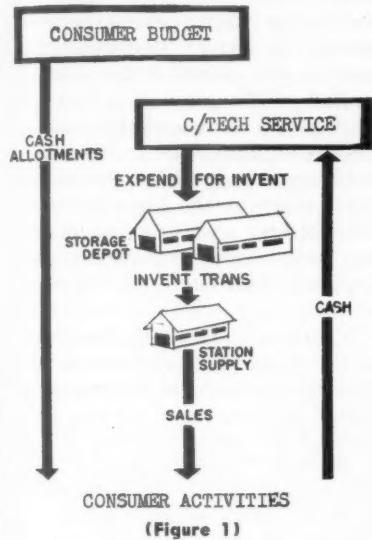
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also makes possible the buyer-seller relationship between supplier and consumer. It eliminates "free issues," and focuses attention on cost of material consumed by operational activities. Figure 1 is an illustration of how the stock fund operates.



4. Industrial Fund

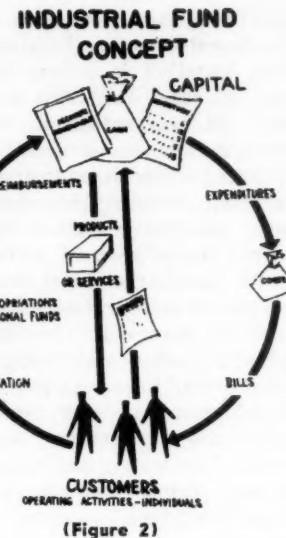
The Industrial Fund like the Stock Fund is a working capital (revolving) fund. It is used to simplify and improve financing and management of industrial and commercial type activities. It also makes possible the same type supplier-consumer relationships as described above for stock funds. An industrially funded installation is, in effect, a small scale "working model" of the FMP to which all of the financial management techniques are applied. In addition a complete management control system is engineered for each installation to be placed under the industrial fund. Figure 2 illustrates the Concept of the Industrial Fund.

Army Gets Canadian Otter

Second de Havilland Plane in Use

The U. S. Army has placed an order for a substantial number of de Havilland DHC-3's *Otter* aircraft to be built in Toronto.

The order was placed after extensive evaluation exercises by the Army's field forces last summer. The Canadian *Beaver*, the *Otter*'s



5. Financial Property Accounting

Inventory accounts are to be maintained in terms of cost, as well as physical quantities, for material (bulk stocks) in depots and other installations. Fixed property accounts for capital-type items will be maintained to reflect cost and physical quantities of installed property and equipment in use. These financial property accounts are to be incorporated in the integrated accounting system. Financial inventory accounts will support the stock fund. Dollar accounting for property provides an additional tool to supply managers for improved inventory management. It will also provide financial data for cost budgeting.

6. Integrated Accounting

Integrated Accounting will provide a system of accounting for all financial transactions within a single comprehensive system of related records. There have been in

precedessor with the Army, has been in service in Korea and elsewhere throughout the world.

The *Otter*, like the *Beaver*, is especially designed for special purposes of utility transport in undeveloped regions. The plane can be equipped with wheels, floats or skis.

Equipped to carry 11 passengers or a payload of 2,400 lbs., the *Otter* is powered by a P&W *Wasp* engine of 600 hp.

the Army Establishment 33 more or less unrelated accounting systems. As many as 8 or 10 of these may be in operation at a single installation. Under the FMP certain new accounting systems are being introduced such as FPA, Stock Funds, etc. It is necessary to bring these independent and unrelated systems under control so that they will provide reconcilable and valid data for management decisions. Accounting and disbursing is to be a command function. The principles of accrual accounting and double entry bookkeeping are to be employed. Operation and control of the system is to be exercised by the Installation Finance and Accounting Officer under the direction and supervision of the installation Comptroller. Figure 3 portrays the bookkeeping control under the integrated system. At the hub of the wheel the general ledger is maintained by the F&AO. The spokes, representing subsidiary accounting records designed to meet varying needs of operating activities, are under bookkeeping control at all times. The total costs recorded in one segment of these subsidiary accounting records must agree with the change in accounts of the general ledger. This control insures the reliability and integrity of all reports of the accounting system.



7. Audit

The Army has developed and is conducting a centralized program of auditing by the Army Audit Agency which reports directly to the Comptroller of the Army. The Army has borrowed freely from industry in developing its new audit techniques and procedures. The audit program is founded on the following basic considerations: (1) Auditing must be independent of operations to be effective; (2) it is

primarily an appraisal activity but includes verification to the extent necessary; (3) it deals primarily with accounting and financial matters but may appraise matters of an operating nature having financial significance; (4) it provides a protective and constructive service; and (5) it is a "staff" function which avoids "operating" responsibility.

Internal audit procedures now provide for a comprehensive "installation-type" audit in lieu of the former "account-type" audit. In the field of contract audit, the Army Audit Agency conducts audits of procurement contracts and renders an advisory service to procurement in financial and accounting areas.

Implementation of the FMP

a. Personnel and Training

Successful execution of the Army's Financial Management Plan requires the provision of competent people to operate the systems and to use the data produced.

To provide competent people action is being taken along a number of lines. An advanced course in comptrollership is conducted at Syracuse University. A program of financial management courses and comptrollership has been started at the Army Finance School. Programs for recruiting college graduates for civilian employment in the financial management field have been inaugurated. Coverage of the new financial management concepts is provided for senior officers in the recently instituted Command Management School. A D/A team headed by Lt. General G. H. Decker, (then Comptroller of the Army) recently conducted indoctrination seminars for the Commanding General and Staff at each CONUS Army headquarters. They, in turn, have carried the indoctrination to their subordinate installations. Two publications covering the financial management indoctrination material have been disseminated to interested officers and activities. A film on the FMP is being developed for showing to all officers in the active Army and the Reserve.

b. Systems and Techniques

The Army has made considerable progress in proceeding towards the objectives of PL 216 and implementation of the FMP. Finan-

cial Inventory Accounting, Stock Funds and Consumer Funding have been installed in substantial degree and plans have been made for their further extension. Sixteen Army installations or activities are operating under the industrial fund and their operating procedures are being constantly studied and improved. Integration of accounting at the installation level has been initiated and firm plans have been made for extension. The "staff developed" budget and "budget execution plans" have been introduced. Development of cost-of-performance budget procedures has been initiated for testing and installation in posts, camps, and stations. The "installation-type" internal audit procedure has been instituted. Plans have been approved for establishing audit sub-offices at major logistic-type installations and for assumption of operating responsibility for oversea audit by the Army Audit Agency.

Conclusion

1. Top management, both civilian and military, in the Department of the Army have given this program their active and enthusi-

astic support. This includes Secretary Stevens and General Ridgway as well as their predecessors Secretary Pace and General Collins.

2. The successful implementation of the Army Financial Management Plan should go a long way toward demonstrating to Congress and the public that the Army can manage its business affairs with the same degree of skill it has demonstrated in the art and science of warfare. To our knowledge no one has ever accused the Army of "not knowing how to fight." In recent years, however, the Army has been criticized for such things as buying too little ammunition, too much pepper and the wrong kind of overcoats.

3. In the final analysis the effects of this plan, while directed at improving our business management, should produce more effective conduct of our military affairs. For it is through "better command control of resources and operations" that we shall achieve maximum combat effectiveness from the resources—men, money, material and facilities—that are made available to us.

Comptrollership

(Continued from page 13)

the extent of the money expended and all costs for a particular productive or overhead job are accumulated in a single customer order or expense account.

CUT-OVER PROCEDURES

Prior to the cut-over from Appropriation Accounting to Industrial Fund operations, a panel composed of individuals from the Bureau of Ships and the Navy Department Comptroller spends several weeks at each Yard in connection with the indoctrination of personnel, not only in the Comptroller Department, but other departments of the Shipyard, and in the establishment of the necessary procedures to be placed in effect.

Simultaneously, each Yard conducts its own instruction and indoctrination in Industrial Fund operations, especially at the lower levels of management. Shop personnel have a naturally suspicious attitude toward any change from an old

established system and should be drawn into the "family" in the formative stages or at the earliest practicable date. There are many changes that are difficult for the shops to assimilate.

THE PROJECT CASH ACCOUNT

The Yard is given a charter and a grant of funds on which to operate. This is known as the Project Cash Account. In the case of Charleston it was \$11,000,000. This Project Cash Account is a portion of the Navy Industrial Fund and essentially it is a revolving fund. Work requests are sent in by the type commanders and others who desire work performed. In the case of private companies or individuals, the request must be accompanied by a deposit of funds based on the estimated cost of the work to be performed. As material or labor is used, it is immediately charged to the industrial fund; there is no longer any such thing as an "obligation" against an appropriation. It is true that, due to the lag in accounting and billing, work in

progress at any given time is an obligation against the appropriate allotment or project order but there is no longer any obligation against an appropriation as previously understood. Every charge becomes an expenditure from the Project Cash Account as soon as any material or labor is used. Costs are either recorded at the time incurred, or regularly each month in the case of accruals, and not at some convenient time when the goods or services happen to be paid for. This makes for a cost picture directly related to actual day to day operating conditions. At the completion of the work, or each month in the case of jobs extending over a considerable period of time, the customer is billed for the amount so expended, including overhead, and the funds received serve to replenish the Project Cash Account.

From the initial allocation of funds, in our case \$11,000,000, we immediately set aside in an accrued leave account some \$3,000,000 to cover the exact amount of employees' accrued leave existing at the time of cut-over. This account will generally remain fairly constant, except in the event of an extreme change in the level of total yard employment from that existing at the date of cut-over. The customer is charged for employees' time at a rate averaging about 17% greater than the actual wages paid him, to cover annual and sick leave. This is referred to as "accelerated labor." The extra 17% that the customer pays goes into the accrued leave account. The cost of annual and sick leave taken by the employees is charged to this account, as is also any lump sum leave payments made to separated employees.

Expense centers to accept all charges are established in two categories. The Productive Shops—Shipfitter, Sheetmetal, Pipe, etc., constitute the "Productive Cost Centers." There are 18 of them. Other general and administrative departments of the Shipyard—Planning, Supply, Comptroller, Administrative, etc., are known as "General Expense Centers," and there are also 18 in this category. Each expense center is broken down into 33 operational cost classes (salaries, fuel, transportation, etc.), and 10

maintenance cost classes (tools, office equipment, etc.).

INVENTORIES

With the inception of the Navy Industrial Fund, the project cash account finances inventories required for the level of operations carried on by the activity. At the Charleston Naval Shipyard, inventories of shop stores and direct materials approximate 20% of the total value of all assets, or some \$3,000,000. With such a sizable investment in inventories, policies and procedures for the adequate control of levels and nature of inventories are important.

Materials, next to cash, are the assets most vulnerable to misuse, and pilferage. The investment in inventories is recovered by passing this material to a consumer "as is" or by additional processing or fabrication. It is management's responsibility to exercise controls over inventories so as to insure that the investment therein will be recovered and that large sums of

working capital are not tied up in dead or slow-moving stock. Optimum controls exist when the materials on hand are ready for use, are of the right quality and condition, and in sufficient quantity at the right time.

Inadequate clerical and physical controls can result in undesirable levels of material and duplication in procurement. Either under or over-stocking breeds an unhealthy condition. Understocking hampers production schedules, while over-stocking utilizes valuable space, restricts funds, and jeopardizes the liquidity of the establishment by possible financial losses on obsolete material due to technological advances and replacement price fluctuations. A physical inventory of all shop stores taken by the Comptroller Department at Charleston after six months' operation under NIF recovered nearly half a million dollars of assets of which there was no record. This served to alert Shipyard Management, at all levels, to the necessity for insuring that

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BUDGETING

Navy Industrial Fund Regulations state: "Each establishment operated under the Naval Industrial Fund shall prepare a commercial type budget annually, covering the operating cost of the establishment upon the basis of cost accounting and showing how such costs will be financed. Such budgets shall be reviewed at least quarterly and adjusted as circumstances warrant." Based on the quarterly review provided by this Secretary of Defense regulation, each Shipyard is required by directives issued at a SecNav level to prepare a complete budget for each quarter of the fiscal year, in addition to the annual budget. From a practical Shipyard standpoint, these quarterly budgets are the tool used by local management, since changes in workload and employment levels beyond the control of local management prevent the annual budget from being accurate for more than a few months.

These budgets take the form of a set of financial and operating statements covering the estimated workload, operating costs, non-operating costs, procurement of materials and supplies for stock, and summaries of the estimated results of operations. The heart of the budget is the estimate of civilian personnel requirements, or "ECPR," which gives an analysis of expected Shipyard workload for the ensuing six months by types of work, such as conversion, repairs, alterations, manufacturing, etc. This direct labor breakdown of future scheduled work is the best estimate of the Production and Planning Departments.

The Comptroller Department converts the figures furnished by each cost center into a complete set of operating statements which is estimated to be accurate as of the end of the period budgeted. Experience factors, such as, payroll rates, material-labor ratios, leave and absence averages, current inventory balances, etc., are combined with the estimated personnel ceilings and necessary distribution of personnel between departments to establish a PLAN OF OPERA-

TION and the necessary overhead rate is determined. All cost centers carry the same general expense overhead rate and, in addition, the productive cost centers carry a productive overhead rate. From these rates, based on the workload budgeted for, a composite total yard overhead rate is established at a certain amount, say, \$1.80 per direct labor hour. It should be noted that perhaps \$1.15 of this amount is for general expense overload. Individual shop rates will vary from this average. It is noted that under Industrial Fund operations the Comptroller Department should establish the overhead rates. The old "Accounting Board" is a thing of the past and is no longer necessary. Accurate records and forecasting make it unnecessary to change the overhead rate oftener than once each quarter.

CONTROL OF DIRECT MATERIAL

Every phase of Industrial Fund operations poses problems, specific answers to which cannot be found in the regulations. Some of these involve proper cost classification; others involve budgeting; there are many problems connected with general expense overhead, primarily in connection with whether to charge certain costs to general expense overhead or make an effort to identify these charges to a particular productive shop.

Since one of the important "problem areas" centers around the control of direct material, I will explain the system for the control of direct material in effect at the Charleston Naval Shipyard.

First of all, stubs for material are originated, usually in the Planning Department, in 9 copies, the originator retaining copy No. 9 and sending the other 8 copies to the Supply Department.

Supply retains copy No. 8 and delivers the material to the shop, accompanied by the other copies of the stub. When the shop receives the material, it receipts on the folio, retains two copies of the stub and returns the others to Supply, where they are used for proof of delivery, stock and issue control, etc.

When the shop actually uses the material received on the stub requisition, that fact is noted on one of their copies of the stub requisition and it is sent to the Comptroller.

Each day cost cards or financial detail cards covering all material stubbed out to the shops are sent to the Comptroller by the Supply Department where they are taken up in the Direct Material Inventory. This Direct Material Inventory is an interim account to provide accountability for material between the time it leaves custody of the Supply Department and the time it is actually used on the job, or otherwise accounted for.

In the Comptroller Department the copy of the stub received from the shop is hand-matched with the financial detail card in the Direct Material Inventory, and the amount is removed from the Direct Material Inventory and placed in Work-in-Progress as a charge against the job indicated.

At any one time there are 4,000 to 6,000 cards in the direct material inventory, with a total value of from \$500,000 to \$2,000,000. The entire maintenance of DMI, WIP and the matching procedures are accomplished in the Comptroller Department by three individuals. Tabulating machine work, of course, is done on the floor by operators in the Machine Accounting Branch.

The cost card and one copy of the stub requisition are sufficient controls for the Comptroller Department. Control of material within the shop is by their retained copy of the stub and by a copy of the material requisition which is sent to the shop by Planning at the time the stub goes to the Supply Department.

This may appear to be a complicated procedure, but, in practice, it is simple and foolproof. The principal advantage of this system is that no material charge is made to

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a job except on receipt of a copy of the stub from the shop which tells the Comptroller, in effect, "This material was used on this job in the amount indicated." At least once a month, surveys are made of stubs issued and material remaining in the Direct Material Inventory an inordinately long time, and any necessary corrective action is initiated.

There are ancillary controls to provide for material in DMI being returned to Supply or placed in Shop Stores without being used on the job and for the use of only a portion of material ordered out.

FINANCIAL AND OPERATING STATEMENTS

Under appropriation accounting, monthly financial statements were, in effect, only a relatively broad analysis of overhead costs, and while ground rules for their preparation were promulgated, those ground rules were subject to varying interpretations by the several Shipyards. The statements furnishing little information that could assist Shipyard management. Under Industrial Fund operations, up-to-date financial reports are furnished monthly by the Comptroller, set forth according to modern commercial accounting practices. These financial reports include a statement of financial condition or balance sheet, a statement of income and expenses, details of accounts receivable, accounts payable, inventory, and a breakdown of each productive and general expense center. The principal variance with commercial practices is that land, buildings and equipment are not included as funded assets and military pay, retirement and disability compensation are recorded only as statistical information as they are still handled under appropriation accounting.

These monthly statements, supplemented by periodic IBM tabulations showing the exact status of every job order, are valuable tools to Shipyard management. As all levels of Shipyard management, from the Shipyard Commander to the Master or Foreman of each individual shop, become familiar with these statements, they are able to operate at their own level far more effectively than before. Education and indoctrination into

the use of the reports emanating from the Comptroller, particularly as far as shop personnel is concerned, is one of the Comptroller's responsibilities and one that should be initiated at the time of cut-over to industrial fund operations or, preferably, immediately prior thereto. It was particularly gratifying to me personally to learn that recently at our Shipyard a request was made to the Comptroller Department for sufficient copies of the Monthly Financial and Operating Statements to be made available for distribution to all Productive Shops.

COMPARISON WITH PRIVATE ENTERPRISE

Operation of a Naval Shipyard under the Naval Industrial Fund closely approximates operation of a private industrial enterprise, with

a few particular exceptions.

The first is profit, or should we say "lack of profit." A private enterprise is run for the benefit of the stockholders and must show a profit to survive. On the other hand, the goal of Naval Shipyard operation is to establish a predetermined overhead rate that will permit the Yard to "break even" with no over or under absorption, no profit or loss.

This second exception is "Military Support." Its definition is "services rendered to activities which do not contribute to the prime mission of the Shipyard." These include inspection of shore electronic installations, maintenance of public quarters, accounting for other Naval District Activities, etc. Military Support repre-



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sents functions required to be performed due to the military nature of a naval shipyard and is financed by Military Support allotment from the Bureau of Ships and from other activities. There is often a narrow line between general expense overhead and military support and, in questionable cases, the Comptroller of the Shipyard must make an administrative decision as to which to charge.

The last exception has to do with certain items still financed by Appropriation Accounting. These include military salaries, reserve for depreciation of buildings and equipment, retirement expenses and disability compensation. As previously stated, provision is made for major non-recurring maintenance, but that does not extend into a depreciation reserve. It is possible that at some future date these items will be included.

INDUSTRIAL FUNDS VS. STOCK FUNDS

I find there has been some confusion between Industrial funds and stock funds. Both are revolving funds. A stock fund finances selected categories of items not only within continental supply depots but all over the world. An industrial fund finances industrial and commercial type operations and a segment of the Naval Industrial Fund, a Project Cash Account, is set up to finance operations at one point, such as, a Naval Shipyard. A stock fund can buy from an industrial fund and sell to it.

SUMMARY

The major points which I wish to leave with you are:

1 Industrial Fund operation at any field activity is not just another system of accounting; it represents a new concept of management.

2 The basic requirement for a Comptroller is that he must be a good administrator with adequate experience outside the field of accounting.

3 Under Industrial Fund operations, more accurate costs are available and equitable charges are made. The customer receiving the service pays for all the service received, no more or no less.

4 For the first time, financial and operating statements are available that can be used by management

and understood by business men and by members of the Congress.

Bear in mind that Accounting records merely disclose figures relating to past operations. Business decisions depend on estimates of the future. Accounting records cannot, therefore, be used as a guide for future action without considering how far the conditions that have existed in the past will continue into the future. This determination and coordination with accounting records is one of the responsibilities of the Comptroller and is one of the basic reasons for the introduction of Comptrollership into modern management.

MANAGEMENT SELF-EVALUATION



This month we continue the series in a "Guide for the Self-Evaluation of Management" which began in the February issue of Armed Forces Management.

M. Office Layout.

1. What plan is followed in review and control of space requirements?

2. Are desks, equipment and work spaces arranged to permit a straight-line flow of work?

3. Does the arrangement of furniture and equipment provide for effective utilization of space?

4. Is the space properly:

- a. Ventilated?
- b. Heated?
- c. Lighted?

5. If environmental factors are satisfactory, was it accomplished by measurement or by trial and error?

6. Is prime office space used for storage of old records, unused equipment, etc.?

7. Are there evidences of unusual confusion of noise?

8. Are noisy machines isolated?

9. Are walls soundproofed?

10. Have environmental factors (noise, glare, etc.) ever been considered in relation to fatigue and excess absences?

11. Are machines, files, etc. within easy reach of users?

12. Are related work units near each other?

13. Has installation of more modern equipment been considered?

14. What type of equipment, if any, would be more suitable than present equipment?

N. Supplies.

1. Are supplies procured in proper quantities?

2. How many requisitions and purchase orders are issued each month to procure supplies?

3. What is the ratio of the value of the order and the cost of making it?

4. What steps have been taken to conserve supplies?

5. How much space is devoted to storage of supplies?

(Concluded next month)

Sea Legs

(Continued from page 9)

sound a bit too autocratic, I add that subsequently the action must be justified by an explanatory and unsatisfactory fitness report on that officer. Likewise, with bluejackets, he can take immediate non-judicial action to reassign, discipline, or render innocuous any member of his crew who is inefficient or recalcitrant. Although there are strong guide lines existent to preserve the rather pure standard organization of naval ships, the captain has much leeway in making changes. He can also assign or relieve personnel at will, such as giving a very junior officer maneuvering responsibility or putting a yeoman in the bakeshop, if desirable.

The responsibility of a commanding officer is quite extensive. As unrealistic as it may sound, he is even responsible for his men and their conduct while they are ashore. His responsibility extends to — and through—every man on board and cannot be abrogated because of its scope. It is continuous for twenty-four hours a day—whether asleep or awake, in port or at sea. If a fire-

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man in the bowels of the ship errs and jeopardizes the ship, the captain is held responsible. He should have trained the man better, not assigned him, or got rid of him. The captain should have exercised his authority effectively and in time.

The captain must be prepared for the moments he must sleep, probable emergencies, the exigencies of entering a foreign port selling strange rum and warm beer. This responsibility may seem unduly large and awesome, for it covers, and may possibly make or break, a group of two or three thousand men, and may entail the loss of a \$125 million vessel that represents the United States on the high seas and in foreign ports. To the naval man trained for and aspiring to this responsibility, it represents a confidence that is cumulative in spurring him on and in increasing his capabilities to make decisions and act effectively.

Flexibility of Shipboard Organization

As I mentioned, the organization of a carrier for effective management must appear strange to a novice. It must appear unique to an industry where the personnel work on single job classifications and to the precepts of labor organizations, where the word "dynamic" is applied to growth potential rather than to a large number of varying missions, and where the index of good organization is inversely proportional to the number of lateral or "cooperative" tie-ins. As in industry, the organization of a carrier—or any naval ship for that matter—bows to the iron-bound maxim that a man should have only one boss. A ship is faced on one hand with the problem of having a number of totally different situations to meet and jobs to do, and, on the other hand, with a definite limitation on numbers of men and a need to utilize every man to full capacity.

A ship does not have one organization based on the chief employment of each individual and using lateral tie-ins to handle subordinate tasks. The Navy has elected to use the same personnel in a number of different organizations—not simultaneously but by re-aligning the ship's company into specific organizations as the need arises to meet particular objectives. In this way it

preserves direct and authoritative lines of control and information in any situation.

This rapid shifting of organization is feasible because of the military aspects of the Navy. The complement of a ship is based on its Battle organization, but the personnel are trained and constantly geared up to shift into other organizations, such as for general drills, for routine steaming watches, or for exerting maximum effort toward damage control. Initiating any of these organizations by policy, bugle call, or a general alarm, is in effect stating the paramount and immediate mission of all hands and reorganizing the crew so that direct controls are available in furthering that mission. Of course there is much intermeshing of these basic organizations. Needless to say, the captain heads up each, although he deals with different functionaries. In a battle organization some of the cooks will continue to cook while other cooks may pass ammunition or become part of a repair party to close water-tight doors, isolate fire mains, put out fires, or give first aid. There are various degrees of these basic organizations. For example, all guns are manned and the air department is on station when at General Quarters and ready for battle; but there are also provisions for firing any portion of the guns or operating aircraft without disrupting the non-interested segments of the ship.

There are also many minor functional organizations, such as the Fire and Rescue Party, or Special Sea Details for navigating particularly hazardous waters, which can be called out as necessary. There is an organization which permits the majority of the crew to go on liberty and still preserves the security and limited capabilities of the command. Once, for example, I got underway and proceeded at high speed to foreign waters—over a weekend—without being able to recall my crew from liberty ashore.

This principle of creating special organizations—reallocating personnel to meet functional tasks—has its disadvantages and can be as complex as some of the organizations found ashore, but it is necessary in the Navy so that responsibilities and authority can flow directly and al-

ways be definite when action is required. While it is true that no man has more than one boss while in a specific organization, it is conceivable that he may have as many bosses as organizations. In practice on a well run ship, it is worked out by assignment of men and billets so that a man is usually working for the same petty officer when gassing a plane, fighting a fire, cleaning his spaces, or loading stores. It is more difficult with officers whose scope of duties is much broader. An officer may be serving on a court-martial board, standing watch as Officer of the Deck, or controlling aircraft from the Combat Information Center, in each instance having a different supervisor. His only common denominator is his skipper.

The administrative organization is set up and provides machinery to insure just evaluation of individuals. There is practically no problem because of the inherent compactness of a sea-going command, the free flow of information, and because both enlisted men and officers generate a service or shipboard reputation.

There is no turning on and off of the administrative organization. Like paperwork it goes on forever. The ship's company turns to administrative processes such as policy making, letter writing, training, cleaning and tailoring, when there is nothing more urgent at hand. It is a duty of management to realize the situation throughout the whole ship, to evaluate it, and not to expect expeditious reports or the normal standards of cleanliness immediately after a man has been through sustained and sleepless operations for forty-eight or seventy-two hours.

A specific look at the organization of a large carrier and how some of the major responsibilities are delineated will show a remarkable similarity to smart operating outfits

Big Business!

● Department of the Army Secretary Robert T. Stevens, recently released some impressive facts on Army spending. The Army spends \$30 million a day, has fixed assets of \$43 billion and carries an inventory of one million items.

ashore. It will illustrate how sharply an organization can be defined through years of experience. It should be borne in mind, however, that although well defined, the organization of a ship is not rigid, and even the standard organization of a ship is modified from time to time to keep abreast of modern technological and operating conditions. Another fact to keep in mind is that the turnover of officers and men is so regular and the *average* quality so much the same that the characteristics of individuals are not an organizational consideration. A billet need not be made for Uncle Elmer because he is on a board of directors. Joe Gish as a Commander should be fitted and qualified to hold down the job of Executive Officer or he should be relieved.

A City in Itself

The Captain heading the organization of a ship even in these complex times does not share his authority. There are many technical, administrative, and operational controls affecting a ship, but they are exercised through the Captain or in such a way that they in no manner affect his authority or act to abrogate his responsibilities. A different view of the Captain's position may be had if you consider him Major, Justice of the Peace, Superintendent of Police, Manager, Treasurer, and Comptroller of a city of two thousand active men—a city which makes and controls its own utilities, contains five restaurants, one jail, a Catholic and Protestant church, eight barbers, four confectionary stores, two soda fountains, tailor shop, print shop, an airport with 50 to 90 hot airplanes, and enough storehouses so that the city can subsist well over three months without assistance from the Red Cross. This city has a baseball team, a basketball team, one bus, about 20 automobiles, one hospital, a dental office, and 16 first-aid stations.

Shipboard Organization and Operation

Directly under the Captain is the Executive Officer, his understudy and alter-ego, with the specific duty of handling the internal administration of the ship. Under the Exec are the eight heads of Departments: Operations, Engineering,

Pier-Heliport Opened

• The world's first steamship pier which can double in brass as a heliport has been opened in New York. The two-story, concrete-roofed structure cost \$12 million. It can ferry passengers directly to ship-side from nearby airports and vice versa.

Navigation, Air, Gunnery, Supply, Medical, and Dental. Every nut and bolt, wheel or cog, man or function on board a carrier is under the definitely defined cognizance of one, and only one, of these officers.

Of course there are gray areas. The Navigator, for example, is responsible for the use and the testing of the steering gear and its five control points, but he and his small group of quartermasters cannot supply the electricity or necessary mechanical talent for repairs. The Chief Engineer is responsible to see that it is workable. The Chief Engineer's responsibility for the care and upkeep of all machinery is not quite absolute, for he does not have the electronic technicians assigned to him. Since the communication equipment and the many radars are the principal tools of the Operations Officer, the electronic repairmen are among his crews.

Many wonder about the division of responsibility between the Air Officer and the Operations Officer on a carrier. The brown-, red-, blue-, yellow-, green-, and white-shirted teams who repair and fuel airplanes, push them around and direct them on the deck, operate the arresting gear and catapults, and assist the aviators—all belong to the Air Officer whose duty is to get airplanes into the air. The Operations Officer plans their missions and exercises control from the time their wheels leave the deck.

The Commanding Officer does not have a Staff or "assistants," at least in the sense that he has advisory groups or individuals extending off on lateral lines and exerting pressure through, and via the authority of, the skipper. His organization is built on vertical lines of authority; his advisers are the same officers and men who must execute the action decided upon. After giving requested advice, they turn their hats around and say, "Can

do," or "Aye-aye, Sir. On the way." The management effort of the Captain is comparatively simple: He merely turns to one of his "staff" advisers, who is also one of his Executive Agents, and says in naval parlance, "Make it so." Naturally, in so using his subordinates as staff assistants, the skipper has a few problems, such as evaluating the enthusiasm, judgment, conservatism, ability, and experience of each adviser. Often after making this evaluation the Captain must add to it his own knowledge of the current situation and the requirements upon him and then take a calculated risk.

The word "Decentralization" seems to be fashionable today among those involved in big industry. The word is popular and the idea has merit, but the degree to which it is followed is questionable because of orders masquerading as policy, many hidden controls, and insistence on arbitrary or proprietary action cutting into the reality of deputized authority. In my opinion, it is the other way around in the navy. Decentralization of authority is not popular, for naval men are too deeply inbred with the necessity for direct control. Yet decentralization in fact and in all its aspects is practiced strongly within the Navy, by necessity as well as because of its human-incentive advantages.

John Paul Jones, commanding a mobile extension of the United States without a supervisor and definitely without effective communications, was certainly an example of decentralization at its best. Even I have operated, acted, made such decisions as were necessary on the high seas and in foreign port many thousands of miles from my reporting senior. I admit I had been well indoctrinated over a period of thirty years, was appropriately versed in many pertinent policies, and anything I did was certainly well reported by myself, newspaper, area commanders, attaches, ambassadors, and the like. This situation consequently is not an example of pure decentralization of authority, but I feel it is as close as we can come to it in the Navy.

Similarities and Differences with Industry

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tion, management, and problems of an aircraft carrier are essentially the same as in industry. Any difference is merely a question of emphasis. The reason for emphasis in certain areas, and for our ability to do as well as we do in our strange environment, stems from the "military aspects" of the job. Under "military aspects" one can include such things as patriotism, indenture, the Navy's stress on leadership, precise timing, and living conditions. The most critical management problem by far that the Navy has—and carrier skippers live and sleep with this one—is the loss of trained technical men to industry because of greater financial incentive, because the grass is greener in the other fellow's yard, and because of the arduous conditions an undermanned Navy must impose on those who have technical capabilities.

Although he would be faced with new problems, I am sure that many of the existing problems of the chief executive in business would be solved if his executives messaged together, lived together, hired quarters in strange ports and formed their own private clubs, and created a comradeship as they do on naval ships. Controversial items are more often than not resolved before they require executive attention. Teamwork is a potent instrument in the management of a ship, and there are many tools the captain can use to promote true teamwork—working with esprit de corps toward a common end.

Naval Emphasis on Leadership

I feel that consciously or not, the Navy has listed Leadership as the most important element in the successful management of a ship. It is a potent force and quite often the only means to achieve successful management. On a ship the officers and men are always on duty—averaging thirteen to sixteen hours of work a day, are in a specially dangerous occupation, and suffer many disruptions of their personal affairs. The ship is often undermanned but nevertheless extensively deployed to further national defense. Such conditions call for effective leadership and not for staff work on human relations. "Human relations" is too formal a term to cover the

many aspects of leadership found necessary in the Navy.

It may seem strange that the Military of all professions feels that the management process is not unilateral, but rather is bilateral, and thus flows up as well as down, and that authority is an empty thing unless men are willing and able to carry out orders. The Navy, at least tacitly, agrees with this principle. It has always accented leadership, and while a captain has the power summarily to award punishments and enforce discipline, the necessity for such action is a blot on his record and in the long count such action does not get the job done.

Although volumes can be written about the various aspects of leadership, one element thereof points up what I consider basic—one which is practiced on board ship and which still does not violate military protocol. It is mutuality. Leadership depends on mutual trust, confidence, and pride between a commanding officer and his men. It depends on a reciprocity of interest in each other's welfare and, in the ultimate, a friendship for each other. This mutuality is not academic; it is a reality. It may not be a stated responsibility, but the skipper and other officers on a ship do a large amount of work for the men, such as preventing injustices, working for additional privileges, helping with personal problems and finances, and writing letters to parents.

Through many casual inspections around the ship, talks with my men, and personally sampling their food, I came to know a surprising number of my ship's company. They knew me well, too, and I am quite

certain they knew everything I did even while ashore. Months after leaving the ship, I was astonished to discover by chance that my berth-deck nickname was not "The Old Man" but "Captain Andy."

This mutuality pays dividends. I do not wish to excuse any of my mistakes, but I say and feel that no man can do a managing job alone. He needs help and advice; part of his duty is to engender an atmosphere wherein this assistance flows freely and gratuitously. In my career I have been saved many a time by my subordinates. A single example is that one night I was bringing a ship into San Diego harbor at a fast but reasonable speed. I could see the lights of a tug and tow ahead, but there was adequate room for passing. Suddenly when we were nearly abreast of the tow, the helmsman sang out, "Captain, I have lost steering control." It happened that by a strange circumstance while turning to conform to the channel, the ship had been hit by a heavy ground swell which caused her to yaw well beyond the capacity of the rudder to control. By immediate and violent use of the engines, the ship was straightened out and a collision was avoided—something I could not have done without the timely and ready assistance of the bridge watch who were indoctrinated not as subordinates but as members of a team with the skipper.

I can recite many instances of where two-way loyalty, confidence, and respect paid off, but one in particular I shall never forget. The LEYTE was moored to a dock in Newport harbor when hurricane Carol of 1954 passed close aboard. When the force of the wind reached 99 knots, the many mooring lines I had out gave way either by parting or by tearing out parts of the concrete dock itself. I give full credit to the ship's company, no one of whom faltered, for a handsome job of getting away from the dock, for staying off a rock pile close to leeward, and for a masterful job of riding out a 110-knot hurricane in a channel. I am complimented by a rumor I heard: When the forward gangway carried away like a kite in the early part of the storm, the crew on the forecastle were heard to say, "We are all set now, men.

Captain Andy can't get ashore."

Discipline and Time Sense

My personal definition of discipline, which may possibly express the attitude of the Navy it, "Discipline is learning to like what must be done." Discipline within and without the Navy is much the same. If there is any difference it arises not so much from the fact that hours are more arduous and that additional personal and professional standards are imposed on board ship above those of a civilian-staffed outfit, but rather because of the introduction of the time element. In getting to the enemy "fustest with the mostest" we are always conscious of the clock. Ships sail on time, rendezvous on time, and attack on time. Guns open fire at the proper time and not when the pointer decides to man his station. This introduction of the time element in every phase of living and working, rather than just get-

ting to the job on time, is to some the very essence of regimentation, the basis of frustration, and the hardest feature to teach in promoting discipline.

Tool of the People

I am sure that if by chance an industrial tycoon reads this article, he would be impressed, as I am when I read of industry, that there is no basic difference and but few minor variations in good management, irrespective of environment. He might wonder at the somewhat arbitrary cast that management appears to take on board ship. I can only answer that we of the Navy are but a tool of the People. We are entrusted with public funds and a number of sons and a job of defense: We have organized to the best of our ability toward this end.

I believe that the Navy's performance in actual combat is the ultimate proof of the effectiveness of our management.

tific foundation a program which provides superior education for technical management.

It is natural for young men qualified for college to aspire to leadership in some field of endeavor, including top managerial positions in industry. Three factors leading to this goal are education; personality—the ability to get along with and direct people; and judgment—the ability to analyze situations and make decisions, based on experience coupled with fundamental training.

An educational program based on engineering combined with modern methods of evaluation and control must be centered around engineering and scientific fundamentals rather than around personnel or industrial relations, important as these latter subjects are. The manager must utilize the tools of personnel relations in accordance with his understanding of the technical operation of his organization. At the same time, he must also use the methods of controlling an industrial operation, the basic tools for which are becoming increasingly complex. He must be educated to evaluate various alternatives on an economic basis, and he must know something about the design or synthesis of production plants, organizations, and procedures.

It is known from experience that fundamental knowledge has lasting value, while specific skills may be only of temporary usefulness. Hence, Cornell courses concentrate on fundamental concepts rather than on techniques. We are concerned with the development of the student's capacity for critical analysis and appraisal on his own.

The specific courses which all mechanical engineering students take in the Industrial and Engineering Administration Department at Cornell are:

Industrial Organization—an orientation course that gives an overall picture of industry, its many functions, and the effects of an engineer's work on a company.

Statistics—a basic tool in experimentation, control, and obtaining and analyzing data which also provides a firm foundation for further study in methods of handling probabilistic situations and in methods of control.

Education

(Continued from page 7)

Engineering. Traditionally many students have sought a combination of engineering and business studies, due to an interest in an education broad enough to encompass all phases of industry. Since a major proportion of manufacturing involves mechanical processes, the logical place for training in industrial, administrative, or management engineering is in close relationship to mechanical engineering. Almost all industries require trained mechanical engineers in both technical and other staff capacities. That the Cornell program has been successful in achieving its objective in the past is evidenced by the fact that fifteen years after graduation seventy percent of its graduates are serving in managerial capacities, largely in technical industries.

It should be emphasized that the Cornell plan is based upon first developing a sound engineering program and then integrating with this the necessary business and management principles and techniques. A student cannot become a good industrial or administrative engineer unless he is first a good

engineer in the true sense of the word. It is believed that, in the future, a student will be unable to become a satisfactory and successful manager of technical operations unless he has first been given a good foundation in engineering or science. Thus, industrial engineering at Cornell is not now approached through a general business course with a smattering of engineering and science courses, but rather through a solid grounding in engineering. This policy was inaugurated at Cornell fifty years ago when Professor Dexter S. Kimball, believing that engineers by the nature of their training and understanding of technological developments would become leaders of industry, started at Cornell an elective course titled "Works Administration," one of the first in the field.

The tremendous scientific, technological and industrial developments of the last half-century have intensified the need for better and broader training for engineers and managers. Consequently Cornell has adopted a five year program for all engineering students, thus making possible the development of a program which enables a qualified undergraduate to superimpose upon a sound technical and sci-

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Methods Engineering—analytic tools such as process and flow charts, the relationship between the worker and the machine or process, including the psychological and physiological factors; and the elements in design that lead to automatic operations. Experience and initial exposure to methods of analysis of complex systems is combined with laboratory experience in evaluation of work measurement techniques.

Cost Accounting and Control—the control of operations from an economic point of view; the economics of decision. The relation of economic control procedures to the equipment complex is emphasized and a foundation for more specialized courses in linear programming, production or inventory planning, and equipment or plant economy is provided.

Production Engineering—the problem that must be solved after a product has been designed, including the selection of manufacturing processes and procedures, the layout of equipment, materials handling, production control, and the economic evaluation of alternative proposals. It is in this course, combined with the coverage of other previous courses, that full comprehension of all technical aspects of automation is combined with economics of the situation.

The strength of these courses lies in their sequence and their integration with other engineering subjects, such as mathematics, engineering mechanics, materials, and machine design. For example, the course in production engineering is taken after the completion of courses in strength of materials, materials processing, machine design, dynamics of machinery, cost control, and statistics. Thus when working on a problem involving the production of a new product, the student is able to consider intelligently the problems of design, material selection, machine selection, and cost in relation to the production problems encountered.

As stated above, all mechanical engineers take a course in applied statistics early in the curriculum. This makes available a very important tool for later courses and enables students to discuss and evaluate many engineering and

managerial problems from a mathematical and statistical point of view, in line with the latest developments in the field of operations research. It is felt that many of the more important developments in industrial management will come through this type of analytical approach.

Having completed his basic work in science, mathematics, and engineering as well as the courses outlined above, the student is prepared to embark upon an integrated elective program of his own construction. As fast as the new conceptions, theories, and techniques of modern management become "teachable" they are absorbed in elective courses. The student with his firm foundation has the background to deal effectively with such subjects as linear programming, statistical control, experimental design, and the newer topics emerging from the developmental process.

The elective program can include work in the other schools and Colleges of the University and the resources of the Psychology and Sociology departments, of the School of Industrial and Labor Relations, of The Graduate School of Business and Public Administration, of Economics, of Agricultural Economics, and others are available. In addition the Cornell Computing Center and various laboratories and shops are available for service when needed.

During the fifth year all students are required to devote a significant effort to a project in some field of their study. Those students who have qualified by their elective pattern and performance may elect a project in the area of Industrial and Engineering Administration. A great deal of effort on the part of the Faculty has been devoted to the projects so that the endeavor might achieve its objectives: providing the students with an opportunity to capitalize on the fundamental concepts and methods covered in earlier work through identification of a problem, analysis of the situation, and design of a solution in a context that presented all of the real breadth of problems of industrial life.

These objectives have been relatively successfully achieved

through the whole-hearted cooperation of industry, which each year volunteers enough problems to occupy the efforts of five or six groups of students and a number of individuals. Some of the problems suggested can not be attacked since they do not involve broad enough scope and do not allow sufficient access to information and current results. Those which do meet these requirements are given to the students in a brief introduction, after which the students themselves take over, with complete liberty and independence of action as long as satisfactory progress is made. Frequent written reports, oral reports, and adherence to a student-planned time table are required. Inevitably the hardest part is to define the problem and the easiest to develop a solution. The evaluation of the solution in a form that is comprehensible to the personnel of the firms and is also rigorous frequently presents a difficult problem, especially when data are incomplete and special studies not possible within the plant environment.

Such projects are usually successful in providing a correlation and integration of previous course work and in emphasizing the technical, functional, and organizational relationships of modern industry. In addition some concept of the problems of group activity is obtained

Reorganization Announced for Army R & D

Centralized control and direction of the Army's research and development programs have been made staff responsibilities of the Deputy Chief of Staff for Plans and Research, according to an announcement by the Department of the Army.

The reorganization of research and development responsibilities, expected to give added strength to the Army's efforts in this field, incorporates recommendations made by the Advisory Committee on Army Organization, scientists, industrialists and the Ad Hoc committee appointed by the Secretary of the Army to implement the Secretary's plan for Army organization.

through the necessity for making estimates, providing information to other groups, meeting time deadlines, co-ordinating the activities of others, and for solving the problems of leadership required by such an endeavor. The staff volunteers nothing, does not direct, and merely provides consultative service and information when such is justified by the situation and requested by the students.

The size of the groups has varied from three to eighteen and the problems have originated in firms employing as few as 20 and as many as 200,000 people. Current projects include a study of the organization and production processes and inventory problems of a winery; a study of a chemical firm's product and processing problems; a reorganization of a machining plant; a recommendation for re-layout and expansion of a printing plant; and a plan for standardization and manufacture of a new line of magnetos for lawn mowers and similar appliances. In all cases market, product, and economic studies were required to develop the bases of the problems and their definition. Some projects provide an opportunity for the introduction of specialized techniques of operations research, for new conceptions of production control, or for new methods or procedures, and all lead to areas of study or investigation the need for which would not otherwise be obvious.

As outlined above, the Cornell program is built upon a foundation of science and mechanical engineering and culminates in a project that verges on operations research. As more of the newer concepts and theories are further developed and the applied science and techniques which result are rationalized changes in the curriculum will be made. The problem of education for the technical manager fifteen years hence or for the management technician is a most difficult one because of the very dynamic conditions of the field. One conclusion seems valid, and that is a sound education in the fundamentals, including statistical competence, the ability to deal in quantification, and various methods of analytical thought will continue to be the starting point. In addition there

must be imported certain concepts which comprehend the economic and equipment synthesis so often termed automation. Also required will be the ability to deal in complex procedural systems which in turn involve electrical, mechanical, and computational elements which must be thoroughly understood. Finally competence and familiarity with the newer applied techniques of modern management will be essential. Those who do not possess all of these resources will be seriously handicapped in their professional development.

Management Improvement

(Continued from page 5)

of Naval Operations, the Deputy Chief of Naval Operations (Air) deals with many matters of direct interest to the Bureau of Aeronautics in the naval aeronautic program.

Management Philosophy

The Bureau of Aeronautics (BuAer) is committed to the management principle of bilateral or multi-lateral administration whereby any decision is made with the participation of the individuals affected. The basic management philosophy of balanced authority and responsibility is kept constantly in mind by all hands, that is, any individual in BuAer who is held responsible for performance in a particular area always has commensurate authority for accomplishment of that assignment.

In its total mission and the major segments thereof, every effort of the Bureau of Aeronautics is oriented to the concept of: "The better to serve and to support the Fleet." How well this bureau accomplishes its mission will always be judged by that standard.

BuAer and its Field Organization

In the first paragraph of this article, it was emphasized that BuAer, at the seat of Government in Washington, is only a relatively small headquarters organization. Much of the actual work for which the Bureau is responsible is performed at its field activities. Under the provisions of General Order 19, the Secretary of the Navy assigns man-

agement control of the naval aeronautical shore establishment to BuAer. Approximately 250 such activities are so assigned. Geographically they extend from Europe and North Africa, through the Atlantic (Bermuda, Newfoundland, and Trinidad), through the Continental U. S. and Alaska, westward through Hawaii to Japan and Okinawa. Some concept of the size of the naval aviation shore establishment under BuAer's management control may be obtained from the following personnel totals:

| On-Board Count for Naval Activities under BuAer Management Control as of 31 December 1954 | |
|---|---------|
| Officer | 8,743 |
| Enlisted | 75,254 |
| Civilian | 74,391 |
| Total | 158,388 |

The cost (not replacement value) of land, buildings, and collateral equipment at these activities totals \$2,085,000,000.00. Thus in plant account and in total personnel BuAer with its field establishment compares in size with large corporations operating on a world-wide basis.

The term, "Management Control," though widely used in the administration of the Naval Shore Establishment, may be unknown to personnel of other Services. Though Management Control is defined in broad terms in General Order 19, BuAer, for its own purposes, defines Management Control as bureau sponsorship, particularly responsibility for primary monetary support, assignment of substantive workload, civilian ceilings and military billet allowances, physical facilities, organizational structure, determination of major administrative policies and procedures, and quality and quantity of work performed.

Field activities assigned to BuAer's Management Control include the following principal categories: Naval and Marine Corps Air Stations and Naval and Marine Corps aeronautical training activities, which are employed for supporting the aviation functions of the Chief of Naval Operations and the aviation operating forces of the Naval Establishment; naval aeronautic research, development, and test activities, which conduct necessary research, tests, investi-

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gations, and developments to obtain suitable apparatus and material for naval purposes; and Bureau of Aeronautics Representatives, who serve as this bureau's representatives in the field for administration of its procurement programs.

Management Improvement Concepts of BuAer

The author believes that the general background stated above is necessary for the reader's better understanding and interpretation of more specific discussion of management improvement to follow. By instructions both internal within BuAer and to its field activities on 18 March 1953, BuAer formalized the Federal Government Management Improvement Program, which stems from Executive Order 10072 and Title X of Public Law 429. From individual reports prepared by BuAer Divisions and by field activities, the Chief of the Bureau of Aeronautics compiles an annual management - improvement report and submits it to the Secretary of the Navy. Thus, management improvement is formally constituted as a year-round program for BuAer and its field activities.

A few highlights of what has been reported as management improvements are:

Integrated Aeronautic Program—Considerably older than the Federal Management Improvement Program itself is the Navy's Integrated Aeronautic Program (IAP). Having its inception in a high-level board convened in 1944, the IAP is the management system which governs several of BuAer's most important programs. Although responsibility for over-all control of the IAP is vested in the Deputy Chief of Naval Operations for Air DCNO(Air), under the IAP, BuAer is assigned responsibility for much action including formulation and submission to DCNO(Air) of proposals for altering the basic framework of the Program when it is considered that such action is necessary to insure that the Program anticipates and provides for changing conditions. After arranging with other interested bureaus, offices, and commands to be represented, the Chief of the Bureau of Aeronautics recently established

the BuAer Committee on IAP Policy, with the following mission:

a. To review the Integrated Aeronautic Program, as set forth in a permanent document known as the Manual of the Integrated Aeronautic Program, both as to policy and practice; and to make policy recommendations, accompanied by methods and procedures if practicable, for improving this Program.

b. To consider other problem areas or programs which are the major responsibility of BuAer and which should be incorporated into the IAP, making recommendations as to policy and, where appropriate, as to procedures for carrying out the policy; to consider both short-range and long-range matters

which contribute to the welfare of the aviation program.

The Committee (composed largely of Flag Officers and Captains and including, in addition to the BuAer members, representatives from DCNO(Air), other bureaus, the training command, and fleet commands) held its first meeting about a year ago with an agenda covering more than fifty items of concern to Naval Aviation. The report of the first meeting covered 34 recommendations for action to be taken. At the end of the reporting period, substantial progress had been made on approximately half of these recommendations. The Committee meets usually each quarter. A follow-up system for action on the recommendations made by the Committee is a significant feature of the Committee's work.

Modernization of the Naval Aeronautical Shore Establishment

All phases of Naval and Marine Corps air operations are directly or indirectly dependent on station support. These stations serve variously as bases for aircraft on missions not conducted from carriers; provide overhaul, repair and modification facilities; function as training centers for pilots and crewmen; or operate as laboratories for the development and test of aeronautical equipment designed to maintain the technical superiority of aircraft in the naval service. During the years following World War II, most of these stations were recognized as being not in phase with the revolutionary advances being made in the design of naval aircraft, and thus were unable to support continuous safe operations of unlimited numbers of high-speed jet aircraft.

Purpose of the boundary layer control system is to improve wing efficiency and provide greater lift. It makes possible reduced landing speed and shorter takeoff run—vital in carrier operations. The boundary-layer system diverts compressed air from the Allison J-33 engine into a tube which runs inside the trailing edge of the wing. The compressed air is then blown at high speed through slots in the tube out over the wing flap and aileron. This blowing effect tends to make the normal flow of air over the wing (the boundary layer) hug the skin surface, increasing lift and delaying stall.

Resembling a high-tailed arrow with straight wings, the new Lockheed trainer exceeds 600 m.p.h. yet lands at only 97 m.p.h., slower than any other jet. It will have a range of about 900 miles.

and navigational training ranges; five of the eight complexes provide port facilities for carriers, overhaul and repair shops, fleet supply, and general support for the complex.

The problem of accomplishing this modernization program, designed for implementation over a period of several years, was made more difficult because of necessity for the immediate establishment of new stations and fields to handle overflow workload resulting from Korean operations. Significant progress continues to be made in modernizing the Naval Aeronautical Shore Establishment.

Station Maintenance—Two examples from the field establishment in the area of cost saving, improved operations, or greater efficiency are:

1. At Naval Air Station, Quonset Point, R. I., the floors of some seaplane hangars and paved parking areas adjacent to the hangars had settled as much as twelve inches. Common remedial methods of removing these 27,000 square yards of surface and replacing with new surface would have required \$216,000. By "mudjacking," a system of pumping a mixture of sandy or topsoil loam, cement, and water under the sunken area, the floors were raised at a cost of only \$48,600.

2. Naval Air Station, San Diego, California, initiated a Fire Power Show program, believed to be new in the Naval Establishment. Lectures and demonstrations were arranged to suit conditions peculiar to the station. The program stressed necessity of safety in handling gasoline and other flammables, by showing characteristics such as vapor flow and flammability. It demonstrated how careless use of equipment may ignite gasoline, and illustrated the importance of special safety devices and precautions to protect the lives of those handling flammable solvents. The program, based on actual case histories of fires and their causes, was enthusiastically received. All personnel attached to the command (including fleet units), witnessed the demonstrations.

Use of Outside Consulting Firms—While BuAer does not make too extensive use of professional management-consulting firms—preferring to assign experienced officer

and civilian personnel to the solution of specific problems with which they already have some familiarity—BuAer does now have underway, or nearing completion, contracts with several nationally known firms for extensive studies in particular areas. These are:

1. Engineered Performance Standards—Over the past several years, at the Overhaul and Repair Departments at major Naval and Marine Corps Air Stations—such as those at Jacksonville, Quonset Point, San Diego, Cherry Point, and Pensacola—a consulting firm has installed a broad system known as the Engineered Performance Standards Program. This system establishes standard time rates for disassembly, repair and replacement, and reassembly operations for complete aircraft and the manifold components thereof. Along with standard rates, there have been associated improvements through more effective layout of work and materials, work simplification, improved methods, and managerial knowledge of worker productivity. Not only have marked increases in productivity resulted, but also workers themselves show great pride in participation and in meeting or exceeding standards.

2. Cost Control Program—Introduction of advanced industrial techniques in aircraft maintenance work at Overhaul and Repair Departments during the past few years has made evident the need for quick and accurate reporting of actual versus standard costs of accomplishments to enable management to control costs of operation and evaluate performance effectively. With the aid of a management consulting firm, BuAer has developed a pilot system at the Overhaul and Repair Department, Naval Air Station, Alameda, which integrates cost accounting with performance evaluation and mecha-

nized production control. The system is now being extended to all Overhaul and Repair Departments.

Development of this system will provide management with information needed for early reversal of unfavorable cost trends, more effective utilization of labor and material, more realistic and timely cost accounting, and improved comparisons of performance between various Overhaul and Repair Departments in the aeronautical shore establishment. Objectives of the system also include better budgeting and the development of a more cost-conscious attitude at local levels.

3. Improvements in Fleet Aircraft Service Squadrons—BuAer engaged a management consulting firm to assist the Commander, Air Force, Pacific Fleet, in studying internal operations of Fleet Aircraft Service Squadrons (FASRON's) so as to obtain maximum operational effectiveness from reduced personnel staffing and also to improve workload control both at staff and FASRON levels. This project is nearing completion, with highly satisfactory results.

4. Engineering Workload at Naval Air Material Center, Philadelphia—BuAer recently engaged a consulting firm to study scheduling of design and engineering workload at Naval Air Material Center, Philadelphia. It is here that much high-priority design work is done on new equipment which is revolutionizing carrier aviation: Steam catapults, high-capacity arresting gear, and nylon barriers to stop a plane which may have failed properly to engage the arresting wires when landing on the deck of a carrier. Greater productivity for design engineers, ease and assurance in meeting deadlines, and more capacity to accept additional high-priority work, will result.

Electronic Computer—A high-speed electronic digital computer has been installed in BuAer. This equipment uses magnetic tapes for input, and records its output through a high-speed printer capable of typing 600 lines of 120 characters, or 72,000 characters a minute. Much data heretofore processed with pencil and spread-sheet can now be handled with enormously greater rapidity, thus mak-

● Biggest bonus: Eastman Kodak Co., long-time leader in bonus payments, will distribute \$28.3-million in extra payments to employees, highest amount on company records. The company's 51,400 workers will get \$28.75 for each \$1,000 earned during 1950-54.

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Awards and Incentives Program

The Navy has long had national recognition both by industry and by other Government agencies for its strong awards and incentives program. Participation by BuAer and its field activities compares favorably with that of other Bureaus and Offices of the Navy Department. During the calendar year 1954, 8,478 beneficial suggestions were submitted by personnel of BuAer and its field activities. Of this number, 3,656 were adopted and resulted in estimated savings of \$4,027,709 during the first year's use. Approximately 38 out of every 100 suggestions submitted were utilized; and, in addition to monetary savings, valuable intangible benefits are realized, such as improved safety, improved employee morale, increased efficiency, and better working conditions.

Two employees of the Research Division of BuAer received a combined award of \$1,000 for their suggestion concerning the improvement of aircraft gun cameras to permit adequate photographic coverage of rocket firing, including rocket impact in the target area. Another BuAer engineer in the Armament Division received a \$300 superior accomplishment cash award for his outstanding work in mine counter-measures. These are but two examples of initiative which have been recognized.

BuAer Management Memos —

Distributed to all hands with the BuAer "Log" or Plan of the Day, at irregular intervals, are BuAer Management Memos — informal, usually one-page-chits on management problems and policies. By these Memos, the Chief of the Bureau of Aeronautics has expressed himself on such subjects as, "The Exception Principle" (when *not* to use the concept of completed staff work); "Work Priorities"; "Contractor Relationships"; "Sacred Cows" (care and feeding of an administrative senior's pet project); and "Correspondence Time Sense." These highly informal and usually lightly written treatises are but one of many means by which the top echelon of BuAer maintains management communication with all hands on the working level.

Germany Spreads Her New Wings

The first four-engine transport (Lockheed Super Constellation) for Germany's newly reborn Lufthansa World Airline, was accepted recently and flown across the Atlantic by two pioneer Lufthansa pilots, Rudolf Mayr and Walter Blume. These two pilots performed some of the prewar Lufthansa's earliest North Atlantic and South Atlantic nonstop exploits over 20 years ago. Trans-Atlantic service to New York is expected to start next month, and a total of eight Lockheed Super Constellations are soon-to-be-completed to begin operations.

Division Directors' Conference —

At a bi-weekly conference of Division Directors and other top staff, the Chief of the Bureau of Aeronautics receives rapid briefing on current problems, solutions, and new developments. In turn, the staff receives current briefing about matters which the Chief has learned or wants done. A full stenographic transcript is taken; from this transcript is prepared a highly condensed but still intelligible summary which serves two purposes: (1) to inform branch heads and other elements of middle management of what's going on; and (2) to preserve a permanent record of decisions and developments. These summaries are often consulted to establish when and what was said and decided about a particular item.

Management Improvement for Contractors and Suppliers

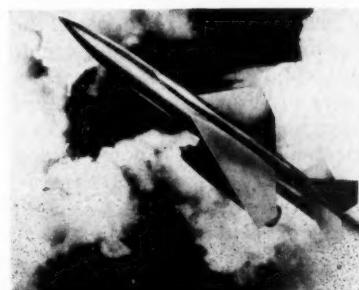
In this article emphasizing management improvement in the Bureau of Aeronautics and its field activities, no detailed information is included about technical developments usually expected of such an organization. BuAer in its normal functioning has fostered such revolutionary new aircraft as vertical risers, water-based jet fighters, turbo-prop seaplane transports, and high subsonic-speed, jet-powered seaplane minelayers; aircraft cameras capable of taking aerial photographs from jet fighters flying at high speeds from either high or extremely low altitudes; guided missiles now in operational use in

the Fleet; multi-channel communication VHF and UHF radios; and airborne radars, fire-control equipment, anti-submarine devices, and other gear of amazing range and accuracy.

Over and above the foregoing few of many normal responsibilities, BuAer has fostered development of numerous industrial processes to improve contractor's manufacturing methods, conserve materials, and procure a better product cheaper. Examples are:

1. *Cold Rolling of Stainless Steel Jet Engine Blades* — Each modern high-thrust jet engine has several hundred blades of many different sizes, each of which is a precise airfoil section. By conventional methods of casting and forging, heat treating and machining, numerous man-hours and extensive machine-tool capacity are required to produce blades for one engine; in full mobilization these requirements would become astronomical. BuAer worked with an old established manufacturer of sterling and plated-silver flatware and cheaper cold-rolled stainless steel cutlery, for the mail-order trade, to perfect a cold-rolling process for jet-engine blades. The manufacturer has considerable skill in die-making and other operations involved in the cold-rolling of stainless steel. The result is a process for making jet blades that has little scrap loss, provides a granular structure which imparts great strength to blades which must withstand high centrifugal forces, and is particularly suited to production of the larger blades used in jet engines.

2. *Casting and Rolling Jet Engine Parts* — Another project resulted in development of a new



Cloaked in military secrecy, Boeing's F-99 Bomarc guided missile is shown in this sketch which depicts it as a sleek delta-wing traveler.



World's first pilotless plane was this Curtiss-Sperry "flying bomb" of 1917 which was developed for the U. S. Navy. Guided with an automatic pilot, it had a range of 50 miles and a top speed of 90 miles per hour.

process for making circular parts for jet engines. By conventional methods these circular parts, of which tremendous numbers are required in jet engines, are forged or cast and then require a great amount of machining. Not only does this process require inordinate man hours and machine hours; it also produces quantities of scrap. The new process involves casting the part in a centrifugal mold and then rolling to approximate size. Cost of the pilot line for producing these parts by the new process was \$665,000.00. It is anticipated that direct savings of more than that amount will be possible for one producer in a year's time, based on current production schedules.

3. Arc-Machining and Arc-Grinding Process — One of the most difficult and costly operations in the manufacture of turbo-jet engines is final forming of turbine blades and nozzle guide vanes. Since the metal used in these blades is extremely tough, machining and grinding operations are slow and costly.

About three years ago, a contractor presented to BuAer a proposal for a process and equipment by which this forming could be accomplished by an electronic method now known as arc-machining or arc-grinding. BuAer placed a contract to develop such a process and the equipment is now in operation. Basically, the process is:

a. Interrupted direct-current energy of relatively high frequency is applied to an electrode.

b. The electrode may be of any desired shape or size and is usually made of soft brass. For grinding operations, a rotating brass wheel

is used. In electrical terms, the electrode is positive; the work piece is negative.

c. When the electrode is brought in close proximity to the work piece (from 0.0002 to 0.015 inches) tiny particles of metal only a few microns in diameter are rapidly removed from the work piece. A coolant solution carries these particles away.

Two machines have been assembled under a development contract and were delivered to a nationally known Cleveland manufacturer in December 1954. These machines are now being evaluated and final results of this evaluation will be forwarded to BuAer before this article is printed. Preliminary reports received to date indicate that the process has promising application in the machining and grinding of hard metals.

4. Project Tinkertoy — Anyone other than a repairman who has ever looked at the underside of the chassis of a household radio or TV set has been baffled by the maze of tube sockets, resistors, capacitors, wires of many colors, and hand-soldered connections. While printed circuits and some other innovations are appearing in newer models of TV's and other electronic gear, the hand-soldered connection is still the bane of the electronics industry.

During World War II the need for proximity fuses in tremendous

quantities emphasized the lack of adaptability of present electronic production techniques to mechanization. Much research and development in this area had met with only moderate success. In the early stages, efforts were concentrated primarily on the further development of printed-circuit techniques, but it seemed essential that some method be developed for preselection of components that would be uniform in performance and could be relied upon, when assembled, to give the desired result. Recognizing this problem and the deficiency of capacity to produce, by conventional methods, the tremendous quantities of electronic gear required under mobilization, BuAer sponsored a program for modular design and mechanized production of electronics as an industrial preparedness measure, known as Project Tinkertoy.

By the Tinkertoy method, automatic machines stack ceramic wafers containing resistors, capacitors, and other electronic elements, one on another; the stack is capped by a vacuum-tube socket. All connections are soldered mechanically. Complete with tube, the package comprises a major segment of a complete circuit. Should one component, such as a resistor or capacitor, fail, the whole package is lifted out, discarded, and replaced by a working package. Tinkertoy has wide applicability to mass-production electronic gear like sonobuoys, and has been made available to the electronics industry. One concern, for demonstration purposes, has made up a number of small, five-tube, table-model radios with a printed-circuit base and five Tinkertoy modules, all in a transparent plastic case; it is amazing how simple a radio, built on Tinkertoy principles, can be.

Project Tinkertoy has generated a great deal of interest and activity in the electronics industry. The principles of Tinkertoy are now finding wide application not only in military gear, but also in consumer goods.

Management Training

In several areas, BuAer formally pursues management and specialized training for both officers and civilians. Examples are:

1. For Station Commanding Officers—In a two-way approach to the solution of indoctrinating shore-station Commanding Officers, BuAer initiated indoctrination courses for small groups of new station Commanding Officers, who are ordered into BuAer for several days of well-organized briefings, preferably after they have been on board their stations for a period of about two months—a sufficient time to become aware of some of the problems with which they must cope. As a second and continuing form of indoctrination for the Commanding Officer this bureau also prepared a document, *The Commanding Officer's Manual for Naval Air Shore Activities*. The subject matter of the Manual views broadly such topics as the current objectives of the Navy in terms of the present international situation, Navy command relationships ashore, and the Federal Management Improvement Program. Specific detail is given on budgetary matters and cost consciousness, plus other general guidance concerning community relations and human relations. The text is written with a light touch for readability, to the extent that the subject matter permits. Response to the Manual was uniformly favorable.

2. Advanced Management Courses for Naval Aviation Officers—Along with other bureaus of the Navy Department and the other Armed Services, BuAer sends a quota of officers to each two-year course at Harvard Graduate School of Business Administration and to other post-graduate management training at Rensselaer Polytechnic Institute and at George Washington University.

3. Harvard Short Course—To each of the 13-week courses given semi-annually at Harvard Graduate School of Business Administration, BuAer sends both officers and key civilians.

Summary

The foregoing examples of management improvement and management consciousness are but a sampling of the continuing emphasis which improved management receives in BuAer and the Naval Aeronautical Shore Establishment.

The author, having only recently

taken the oath as Chief of the Bureau of Aeronautics on 4 March 1955 for a four-year term, finds himself in charge of a large and complex organization. Continued improvement is obviously possible in any organization, and with the collaboration and cooperation of

the many fine officer and civilian personnel now manning the organization, we shall continue to work toward the dual management objectives of better service to the Fleet, and maximizing the return which we taxpayers receive for our dollar.

SALVAGE IS BIG BUSINESS FOR MATS RECLAMATION UNIT

How Reclamation "Found" Four Million Dollars At Westover

WESTOVER AFB, Mass.—Nearly every Air Force base boasts of a salvage operation of some sort. Most of them pay their way—no doubt about that. But at this eastern Military Air Transport Service (MATS) terminus, it pays its way and at the same time saves money.

Since 1946 salvage operations here have saved Uncle Sam some four million dollars. And that "ain't chicken feed" even in these days of inflated dollars and high taxes.

How is it done? Efficient team work is what is making the reclamation section of the 1600th Maintenance Squadron one of the most effective in the Air Force today.

Although primarily concerned with salvaging aircraft, unit personnel will work on "anything and everything" when times are slack. Generally, reclamation will work on any item that can be repaired for less than two-thirds of its list price. Prices listed in the U.S. Air Force Supply Catalog are used as a guide.

Let's see how the unit saves money on airplanes, for instance.

Since 1946 there have been 27 plane crashes in the Westover area. Each crash presents a major problem for reclamation Foreman Walter Millnick and his crew.

Working in conjunction with base disposal, reclamation's main job is to gather the remains of crashed aircraft in the area; save as many parts as possible. The plane may be an Air Force or Air National Guard aircraft, but the procedure is the same.

After officials have investigated the crash, the base engineering officer gives reclamation the "go-ahead." Millnick and his crew then swing into action.

Versatile mechanics transport the

plane to the reclamation area. In many instances a variety of equipment, tools, and assorted slings and "gimmicks" are required to do the job. In case of a "belly landing," where the fuselage is too near the ground to allow use of a jack, huge bags are slipped under the plane and pumped up with air. A jack then can be slid under the fuselage and up she comes.

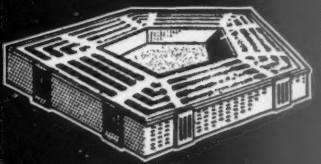
Once the wrecked plane is at reclamation, Millnick must await word from the Middletown (Pa.) Air Materiel Area (MAAMA) as to disposition of the aircraft. MAAMA then send reclamation a list of specific parts to save. The rest of the plane is sent to base salvage where parts are sold as scrap.

Lest anyone think this is small-time stuff, more than \$90,000 worth of salvage was realized from a single F-86D which crashed at Westover about a year ago. The amount is more amazing when it is realized that the plane burned upon crashing and suffered extensive damage.

Though skilled airplane mechanics, Millnick's men are craftsmen in other ways. They do everything from spray-painting to rebuilding power generators. They even repair coffee urns.

Coffee urn small stuff? Only if you consider \$500 small stuff. Sending this particular mess hall coffee urn to the manufacturer for repair would have been prohibitive in cost. So reclamation personnel turned to with a will. Result, a sparkling urn that will brew many another cup of coffee.

On another occasion, barracks wall lockers were destined for the base dump. But not with Westover's salvage men around. The lockers were repaired.



Washington Management

Department of the Army. The Army recently accepted "The Award of Honor" from Mr. Ned H. Dearborn, President of the National Safety Council, for having "one of the most uncomplicated and effective safety programs in the world today."

Department of the Navy. Pearl Harbor Naval Shipyard recently became the eleventh shipyard to be chartered to operate under the Naval Industrial Fund. The occasion was noted with commendation by the Bureau of the Budget, the Department of Defense and the Department of the Navy.

Department of Defense. It's not generally realized how fast guided-missile anti-aircraft batteries are springing up around the United States. Between 14 and 15 major cities will be protected within a short time by 78 NIKE missile "nests." Recent announcement has been made that next in line is a series of NIKE bases to protect strategic points in Alaska.

Department of the Navy. The Navy has just made a historic scientific breakthrough in the underwater detection of submarines. Details of the operation, code-named "Lamplight", are quite properly still secret, but insiders believe the invention will revolutionize under-sea warfare by making it as easy to track submarines underwater as it now is to track planes by radar.

Department of the Air Force. The Air Force has assembled the various financial management systems into a USAF Financial Management System, which is described in simple, understandable terms in AF Pamphlet 170-1-1, and is being sent to all AF organizations down to and including squadron level. The System will enable organizations to better understand their operations by placing a dollar value on each item.

Department of the Navy. A recent announcement reveals that the helicopter has met the test in a

new assignment. Use of helicopters as "aerial" minesweepers, to sweep mines from coastal waters and harbor entrances, has proven successful.

Department of the Air Force. Four District Traffic Offices have been established by the Air Force to provide a field organization for controlling the movement of Air Force cargo and personnel. All offices will be under the jurisdiction of the Air Materiel commanders whose headquarters are at the installations. Offices will be located at Olmstead Air Force Base, Pa., Tinker Air Force Base, Okla., Norton Air Force Base, Calif., and Robbins Air Force Base, Georgia.

Department of Defense. First in a projected series of "radar lighthouses" 150 miles off the Atlantic Coast will be erected late this month near Cape Cod, Mass. The plan, recently released, will provide a protective measure against sneak atomic attack, envisions a string of such bases, manned by the Air Force, extending from Norfolk to Newfoundland.

Department of the Air Force. The Air Force has disclosed its air-

borne FALCON missile, which like the tenacious bulldog, latches onto an enemy target and then races to destroy it at speeds faster than sound. Developed for the Air Force by the Hughes Aircraft Company, the Falcon is one of the most advanced missile types and soon will be installed in Air Force interceptor planes.

Department of the Army. Inquiries are being received daily as to the possible location of Fifth Army Headquarters should it be moved from Chicago. Omaha, Nebraska, and Des Moines, Iowa, are bidding for the headquarters.

Department of Defense. Announcement has been made that the Curtiss-Wright Corporation is participating under Air Force contract in design studies for the application of atomic power to the propulsion of aircraft.

Department of Defense. Rear Admiral Richard E. Byrd will make his fifth journey to the Antarctic in November as Officer-in-Charge of a Defense Department expedition. Navy Task Force 43 has been formed for this purpose and is commanded by Captain George Dufek, USN.

Department of the Navy. Captain Roy Lee Johnson, USN has been appointed the first Commanding Officer of the Aircraft Carrier Forrestal. The 60,000-ton Forrestal is the first ship of her class.

New Helicopter

The Army has contracted with Bell Aircraft Corp. for a new medium-sized helicopter to be used for evacuation, general utility, and instrument training. Designated by Bell as the Model 212, the helicopter carries 800 pounds of cargo, has a cruising speed of 100 knots, and a ceiling of 6,000 feet. Its rate of climb is 1,500 feet a minute.

The 212 is similar to the Bell H-13 but somewhat larger. It is designed to provide a compromise between small helicopters, whose payloads are severely limited, and the large models, whose costs are excessive. It is not known how many of the 212s will be purchased by the Army. A number have already been ordered for testing and evaluation.

Sub-Machine Gun for NATO

The British Sterling sub-machine gun may soon become standard equipment for all NATO forces. Weighing six pounds and firing 575 rounds of 9mm ammunition a minute, the Sterling has been battle tested in Korea, Malaya, and Kenya. Among its features are accuracy up to 200 yards, a self-cleaning breech block that automatically removes fouling, and a double-feed 34-round magazine.

When its butt is folded away the gun can be fired with one hand like a pistol. The Sterling has been adopted by the British army, replacing the Sten gun. It is expected that it will soon be put into mass production in Canada, since 15 countries have already placed orders.



NEWS BRIEFS from the SERVICES

USS Glacier (AGB-4). The Navy's largest icebreaker, structurally designed to equip her for Arctic missions, is nearing completion. Helicopters to locate the best passages through icefields will be carried on a special hanger deck. The 310-foot ship will break through ice up to 20 feet in thickness.

Fort Belvoir, Virginia. Major General Louis W. Prentiss, Commanding General of the Engineer Center, has received a "Certificate of Merit" from the National Fire Protection Association, for Belvoir's achievement in the Army's current fire prevention campaign.

Naval Air Station Los Alamitos. An almost unbelievable "Aircraft-on-Ground" record was achieved during the nine-month period from May 1954 to February 1955. Only three planes of their total of 125 have been AOG. This average is far below the five to ten percent of planes down at other stations.

Fort Lee, Virginia. The Army's annual support exercise LOGEX-55 will begin early this month. Responsibility for the maneuver rotates annually among the service schools. This year's exercise is sponsored by the Medical Field Service School. More than 5000 student officers, observers, umpires and enlisted men will take part in the six-day support maneuver at Fort Lee. LOGEX will be used for the first time to test proposed new logistical concepts developed by the First Logistical Command, Fort Bragg, North Carolina.

Forrest P. Sherman Field, Pensacola, Florida. This installation will become the new home of the "BLUE ANGELS", the Navy's precision flight demonstration team within the next 60-days. The switch from Naval Air Station Corpus Christi is being made both as an economy measure and to relieve jet aircraft congestion. The team re-

cently changed from the Panther F9F's to the newer Cougar F9F-8.

Ordnance Supply Office USN, Mechanicsburg, Pa. Captain Lamar Lee Jr., USN, Commanding Officer recently set the wheels in motion for the organization of a management forum and a management council. The forum consists of a series of bi-weekly presentations by speakers from the Ordnance Supply Office, other government agencies and private industry. It is intended to provide an exchange of management ideas, and Captain Lee intends to personally chairmen the forum. The council will act as a prima medium through which all personnel may assist management in improving the operations of the organization.

Andrews Air Force Base, Maryland. The Air Force's first operational transmissometer, an electronic instrument for accurately recording visibility, has been installed at Andrews. Approximately 20 additional bases are to receive the unit.

Redstone Arsenal, Alabama. A new mission agency to take the nation-wide responsibility for plan-

ning and developing the rocket, guided missile and related programs has been formed. The principal objective of the new division is the control and supervision of these related items under contract for development by major industrial firms throughout the country.

Cherry Point, North Carolina. The Commanding Officer of this Marine Corps Air Station and Commander Marine Corps Air Bases, recently became the Commanding General. Brigadier General Frank C. Croft, who was selected for flag rank last August, officially received his promotion at colorful ceremonies in the office of Major General McCaul, Commanding General, Second Marine Aircraft Wing.

Carswell Air Force Base, Texas. The Air Force's highest fire prevention award, was presented to Carswell recently. Chosen from 138 Air Force installations, the National 1954 Fire Prevention Week Contest Plaque is based on merit, originality, effectiveness of year-round prevention programs and promotional activities.

Sacramento Air Materiel Area, California. For their part in writing and editing a guide on developing and installing a work measurement program, Walter Pfeffer, Virgil Woodworth, Frank Belasco, Claude Farinha and Sue George, received Commander's Achievement Awards from Colonel Theodore Q. Graff, USAF.



SERVICE SCHOOLS

The Engineer School, Fort Belvoir, Virginia. Engineer commanders from the major overseas and continental commands, representatives from various Fort Belvoir units, Office of the Chief of Engineers, Continental Army Command and the Air Force attended a Commander's conference during April. Major General Samuel D. Sturgis, Chief of the Corps of Engineers welcomed the conferees at the opening of the seminar.

Georgia Tech R.O.T.C. By virtue of sweet talk and determination, Teresa Thomas 18, and Jackie Easton, 17, a couple of pert co-eds, have engineered their way into one of the last male retreats. When the two girls boldly inquired about joining the Air Force R.O.T.C. unit last fall, they were discouraged by instructors. Undaunted, they are now reserve officer training corps cadets—the first in any Army, Navy or Air Force unit.

McClellan Air Force Base, Sac-

ARMED FORCES DAY
21 MAY

MAY, 1955

ramento, California. A six-weeks course has recently been completed at McClellan, which included representatives from each of the AMA's plus AMC and USAF. The group studied the new concept of Production Control, Cost Accounting and Work Measurement which is to be effected on an AMA-wise basis as a result of the Ernst and Ernst contracts at SMAMA.

Marquette University, Management Center, Milwaukee, Wisconsin. An intensive short course entitled Pre-Approximated Human Performance Times, will be held at the University from 9-11 May. The Conference Director, Dr. M. E. Mundel, will be assisted by Dr. I. Lazarus. Reservations may be forwarded to Dr. Russell L. Moberly, Director, Management Center.

Army Women's Medical Specialist Corps. The first Annual Institute for selected officers at Walter Reed Army Medical Service Graduate School, Washington, D.C., will be held late this month. The purpose of the Institute is to provide an opportunity to develop increased skill in the principles and practices of administration and personnel management.

Northwestern University (Traffic Institute), Evanston, Illinois. A three-week course in motor vehicle traffic control will be conducted early in June for the Air Force. Subject matter will be divided into the following sections: vehicle accident investigation, Air Force traffic accident and violation reporting, traffic accident prevention, the operator, the pedestrian, the vehicle, the highway, civilian and military traffic laws and rules, supervision of highway, vehicle use and users, and safety education.

U.S. Coast Guard, New London, Conn. Forty new Ensigns are being assigned by the United States Coast Guard following their graduation from Officer Candidate School.

Command Management School, Ft. Belvoir, Va. Among the many distinguished visitors to the Army's new Command Management School at Fort Belvoir, Virginia, has been Congressman Alfred D. Sieminski of New Jersey. Impressed with the School's program and facilities, Congressman Sieminski had this to

say, as recorded in the Congressional Record of January 25, 1955:

THE COMMAND MANAGEMENT SCHOOL

Extension of remarks of HONORABLE ALFRED D. SIEMINSKI of New Jersey in the House of Representatives, Monday, January 24, 1955, as printed in CONGRESSIONAL RECORD of 25 January 1955.

MR. SIEMINSKI: Mr. Speaker, we have heard a great deal recently about our new military look which has been designed to give the taxpayer more defense for the dollar. Members of this body will be glad to know, I am sure, that our Army is leaving no stone unturned in its efforts to improve the efficiency of its operations and to increase the effectiveness of its combat elements.

Last week, at the invitation of my good friend, Col. John Roosma, deputy post commander, Fort Jay, N.Y., I visited a most unique and progressive establishment in the Army at nearby Fort Belvoir, Va. The Army calls it the Command Management School. What I saw was a gigantic step forward in the improvement of military management.

As we all know so well, two-thirds of our mammoth budget is spent for national defense. It is our duty to see that these funds are spent wisely and well. I am convinced that this School will do more to accomplish this end than anything I have yet seen, and I think I might say that I am not without some military experience.

We know that the military has installed, in recent years, many new tools and systems in the management of their installations all over the world. Most of these have been borrowed from our industrial enterprises, which are justly world famous for their managerial efficiency. The Army has recognized, however, that a tool in any system is no better than the executives who administer it. In the Command Management School the Army has accordingly set out to educate its key officers, largely the installation commanders, in how to use these tools and how to apply them to the business of managing an installation.

The Harvard Business School's

advanced management program has been well known for years in the industrial world for its ability to train mature, experienced, business executives and to improve their management skills. The Army's Command Management School has been amazingly successful in adopting the methods applied by this and similar institutions and in converting these methods to their own use in the training of post commanders and principal staff officers.

Under the direction of the Army Comptroller, Lt. Gen. G. B. Decker, and his chief management assistant, Maj. Gen. L. R. Dewey, the School assembles 50 senior Army installation commanders, staff officers, and key civilian employees, each 4 weeks and puts them through an intensive, round-the-clock course in the efficient management of men, money, and materials. A hand-picked and well-trained faculty of senior Army officers is headed by Col. Frank Kowalski, of Meriden, Conn., the School's commandant. He is ably assisted by a civilian management engineer, Mr. Gilbert C. Jacobus, of my own State of New Jersey. The permanent teaching staff is liberally supplemented by outstanding speakers in the management field from industry, from Government, and from the educational world as well as from the military.

I cannot emphasize too strongly that these men, the generals and colonels who command the Army's installations, are the individuals who, in the final analysis, manage the Nation's resources which have been entrusted to them by Congress for our defense. Having seen these officers attacking the Army's management problems at the Command Management School, I know that each one will do his job in a far better and more efficient manner as a result of this training.

The School is indeed a new approach to military education. All of our armed services have been justly praised by every professional educator who has examined their systems of schools, but these, until now, have been limited to the purely military fields of tactics, strategy, and logistics. The Army has now recognized the need for the schooling of its senior officers in the field of nontactical commands, of the

management of resources: Men, money, and materials.

This School for managers is more than just a classroom. It is in effect, a meeting-place, where the officers participating live; they eat, sleep, and breathe management on a 24-hour basis. Needless to say, the assembly of 50 officers, each with 20 or so years of service, represents a vast quantity of experience; experience that can be utilized by colleagues and is shared among all. The commandant told me that this is really the secret of the success of the School. The discussion of down-to-earth, concrete problems and the exchange of ideas on how best to solve them, not only in the classroom, but anywhere and everywhere, goes on literally around the clock. Throughout these discussions the School constantly emphasizes the need for accomplishing assigned missions effectively with fewer dollars. The payoff here is dollars saved. One of the students, a brigadier general who commands a large military post here in the East, told me that he dreams management nearly every night. I might add that he, like all of the other students, is delighted with the course and feels that he really is learning how to improve his post. This is the real proof of the pudding, and I am convinced that the School will stand the test of time.

In my enthusiasm for the School I do not want to give the Members of this body the impression that the Army has become so management minded that it has forgotten the primary reason for its existence. So I hasten to assure you that the School, the faculty, and the officers who attend the course are all keenly aware that the Army exists to accomplish the mission assigned to it, to protect the security of our people around the world. On the other hand, every dollar saved, every wasteful practice eliminated, means just that much more effort can be channeled to increase the combat effectiveness of our Army. This is the purpose of command management, and this is the purpose of the School that I visited.

Mr. Speaker, I am sure that every Member of this body would be impressed, as I was impressed, with this example of progress and forward thinking by our Army. I

strongly recommend that as many as possible visit Fort Belvoir and see the School in operation for themselves. On every battlefield since the days of Valley Forge, our Army has shown its ability to win wars; it is now showing its efficiency in helping to win the peace which, God willing, we can and will attain.

Weber Aircraft Sets Up New Field Service Department

To insure reliable and efficient in-use performance of aircraft equipment manufactured by the company, Weber Aircraft Corporation of Burbank, Calif. has inaugurated a new field service department, according to announcement by Charles B. Buckley, vice-president of the organization. Max Stark will head up the new department and at present is setting up a training program on the B-47 pilot and co-pilot Weber ejection seat to familiarize Air Force personnel with the operation and maintenance of this equipment.

Stark served in World War II with the Maritime Service and is a licensed engineer. He formerly was employed by Lockheed Aircraft Corp. and Airesearch. In 1949 he was project staff member for Hughes Aircraft on the construction of the giant Hughes turbo-jet helicopter.

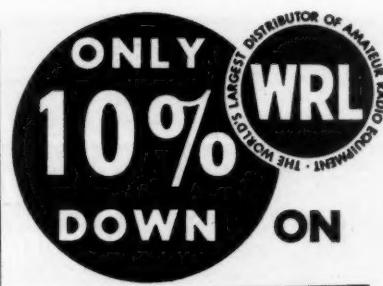
Weber Aircraft manufactures ejection seats, pilot, co-pilot and personnel seats, air frame sub assemblies, galley equipment and other items of interior equipment for both military and commercial aircraft.

Antique Autos at Dix

An anticipated 150 antique autos from New Jersey, New York, Pennsylvania and Connecticut will be one hand at a rally of the Antique Automobile Club of America to be held at Fort Dix, Saturday, May 14.

The announcement was made by S. Kenneth Schultze, general manager of the New Jersey Automobile Club, and Fort Dix authorities said that the event will be open to the general public.

In addition to races and demonstrations by the early "horseless carriages," a demonstration of military convoy precision driving is planned for the club gathering.



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PRODUCTS

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As a service to OPERATING DEPARTMENTS and PURCHASING OFFICERS, ARMED FORCES MANAGEMENT will provide you with a selected list of manufacturers' products.

A Products Information Library has been established and descriptive literature, catalogues, and reference material is available to you without cost or obligation. The firms have been carefully selected, have a high standing in their respective line, and deserve consideration. They are NOT, in each case, advertisers in ARMED FORCES MANAGEMENT, but each offers you a service or product which we feel will be helpful in your operation. Operating and Purchasing departments are respectfully urged to take advantage of this service.

How to Use Armed Forces Management's Library—

Inserted in this issue, a postage free card is provided for your convenience in requesting descriptive and informative literature. This will be forwarded to you, without obligation. Many cost saving ideas are generated by Operating Departments that have referenced information on products available. Purchasing Officials will find this type of information invaluable. All that need be done is: fill in name and address, circle that which will assist you, and drop in the mail.

LEAR INCORPORATED. A new supersonic autopilot designated the L-10 has been announced by the Lear Corporation. The amplifier of the L-10 provides approximately ten times more usable amplifier gain than the Lear F-5 the standard autopilot for the F-86D and the F84E. The L-10 Flight Control System is also designed to operate from guidance signals supplied by either ground or airborne airplane armament systems.

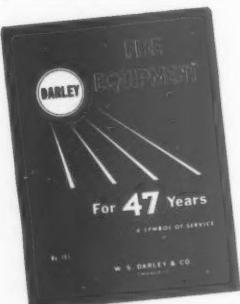
For more facts request No. 1 on reply card

LITTLE GIANT PRODUCTS, INCORPORATED. The Little Giant Road Bird 8, an engine-driven road sweeper, which can be purchased for less than \$1000, is the most economical sweeper available to military installations. Simple in design, this dust-free sweeper solves the problem of dirt, trash, brickbats — even snow removal. Complete specifications are

available on this and other popular Little Giant models.

For more facts request No. 2 on reply card

W. S. DARLEY & COMPANY. (See Cut) Catalog No. 151 is specifically designed for Fire Protec-



tion Organization, Post and Base Engineer's and others responsible for fire and safety. W. S. Darley for 47 years have been leaders in Police, Fire and Municipal supplies.

For more facts request No. 3 on reply card

FULD BROTHERS INCORPORATED. Associated JUST Distributors, through FULD BROTHERS, have introduced a new product, OUT, a washroom fixture cleaner and disinfectant with important advantages over conventional cleaners ordinarily used in washroom maintenance. OUT performs four jobs in one—cleaning, disinfecting, sanitizing and deodorizing.

For more facts request No. 4 on reply card

AMERICAN PHOTOCOPY EQUIPMENT COMPANY. The new APECO Dial-a-matic Auto-Stat enables any office employee to do the work of six expert typists at a fraction of present costs in time and money. The APECO Auto-Stat copy is a picture made without using a camera, in just 45 seconds. This compact machine copies any original up to 15 inches wide, in any length with one simple control.

For more facts request No. 5 on reply card

SICO MANUFACTURING COMPANY. An eight-page brochure describing the complete line of folding, portable tables built by SICO, for schools, institutions, military installations and industry, has just been announced. Also included in the brochure is a brief explanation of the SICO SYSTEM of seat-

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For more facts request No. 6 on reply card

STATHAM LABORATORIES, INCORPORATED. High speed deceleration sled tests in the recent U.S. Air Force Abrupt Acceleration Vehicle Project registered the crushing g forces with Statham Model F accelerometers. The run in which Lt. Col. John Paul Stapp, USAF, attained a speed of 632 miles per hour resulted in his withstanding a peak of 40 g, with an average of approximately 25 g. Weighing less than an ounce, the Model F accelerometers are available in ranges of plus or minus 2 g to plus or minus 100 g.

For more facts request No. 7 on reply card

FELLOWCRAFT ENGINEERING. Recently announced production of a complete line of "Hercule" tarpaulins and coverings of all shapes and sizes, plus a complete line of tents. The new HERCULITE line is made from a new light-weight material which incorporates the use of nylon and vinyl plastic film. Among its many features are exceptional tear strength, complete and easy to store, waterproof, rot and mildew-proof, with sun-fast colors. This material has met most rigid specifications of the Armed Forces.

For more facts request No. 8 on reply card

POTTER & BRUMFIELD MANUFACTURING COMPANY. (American Machine & Foundry) A 70-page brochure containing 23 technical papers covering all aspects of relays is being published. Authored by leading relay engineers, the various papers were originally presented at the Third National Conference on Electromagnetic Relays last month at Oklahoma A & M College. The Relay Conference Brochure can be obtained by writing on organizational letterhead.

For more facts request No. 9 on reply card

LUBER-FINER INCORPORATED. (See cut) After several years of extensive laboratory and field tests, Luber-finer announced this week two new units, Models 500-C and 750-C. Designed to set

a new pattern in the filter industry, the new Luber-finer units incorporate several new and improved features upon which U.S. and foreign



patents have been issued or are pending. The new models provide simplified, faster pack replacement by use of an ingeniously designed clamping ring utilizing a single-bolt closure. This exclusive Luber-finer feature alone, it was reported, will permit a tremendous savings of time and dollars in pack replacement costs.

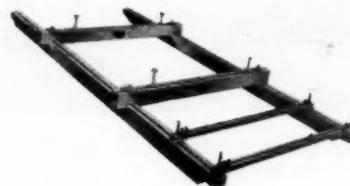
For more facts request No. 10 on reply card

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY. The best electric light switch that technology has come up with yet—those noiseless mercury switches—like good cheese, must age before they are at their best. Sluggishness caused by moisture in the mercury tube will show up after manufacture if the switch has rested for 48 hours. MICRO SWITCH inspectors looked around for a place to "age" their products undisturbed. The logical answer—an old cheese aging room formerly used by a national dairy manufacturer.

For more facts request No. 11 on reply card

HARVEY ALUMINUM CORPORATION. (See Cut) A newly developed, strong, light-weight aluminum extruded skid to replace outmoded wooden and steel skids in the handling and shipping of large equipment, is shown for your information. The skid is made from

standard shape extrusions cut to length, and originally designed to solve shipping problems encountered by the United States Air Force. The Harvey Aluminum extruded skid is 60% lighter than comparable wooden skids and can be



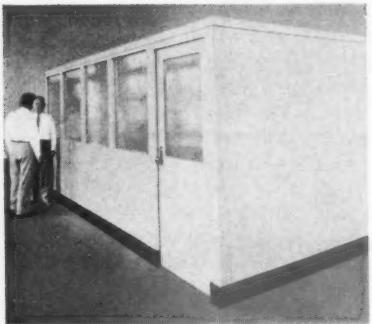
used with any type of handling equipment. The skid can be assembled and disassembled in a few minutes, by unskilled personnel, using a standard wrench or pliers. Requiring little storage space, the skid eliminates maintenance, rust, rot, termites, splinters, warp and will not cause distortion to a machine in storage. A skid beam $3\frac{1}{8}'' \times 4\frac{1}{2}''$ is equivalent in loading holding capacity to an 8" x 8" hardwood beam. Special skids in addition to the standard S-1 model are available for immediate delivery.

For more facts request No. 12 on reply card

PLAS-TIES COMPANY. A new answer to the old problem of what to do with push broom handles on which the threads have been damaged or broken is offered by the Plas-Ties Company, manufacturers of the TAYLOR HAND LATHE. Broken handles can be re-threaded in less than 3 minutes with this new, compact, easy to use hand tool. Truly a cost-saving product, it reduces stocks required, time on the job and the purchase of new handles.

For more facts request No. 13 on reply card

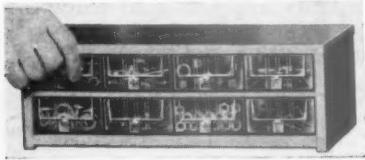
THE MILLS COMPANY. (See Cut), with over 30 years of experience exclusively devoted to the manufacture of movable walls and partitions, recently announced a new type of movable metal wall, which combines light weight, distinctive appearance and superior stability with economy of installation, low maintenance requirements and maximum mobility. Mills' New Executive Partitions are made in all-steel, as well as steel and glass combination units. They are finished at the factory in dur-



able baked-on enamel, in any specified shade or color, requiring no maintenance except occasional washing. Movable walls have proven their value to cost-conscious industry and are becoming popular with military installations.

For more facts request No. 14 on reply card

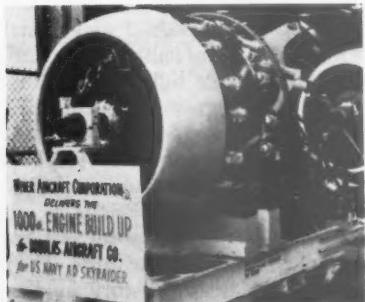
GENERAL INDUSTRIAL COMPANY. (See Cut) A sturdy steel cabinet with eight crystal-clear, "See-Thru" drawers will answer many small-parts storage



needs. The transparent plastic drawers enable the user to spot, at a glance, the drawer in which the desired parts are stored. This long established manufacturer noted for labor-saving equipment has a complete catalog of equipment for review. One popular item is the 4" H x 12½" W x 6" D, finished in silver-grey baked enamel with rubber feet, priced at just \$4.25.

For more facts request No. 15 on reply card

WEBER AIRCRAFT CORPORATION. (See Cut) Weber Aircraft announces completion for the Douglas Aircraft Corporation of the 1,000th engine build-up for the



40

Navy AD skyraider. All components are supplied and assembly of the complete engine is accomplished on Weber's assembly line. Unique in production, a common dolly is used, and the engine is shipped to Douglas ready to move into their assembly line without the necessity of uncrating.

For more facts request No. 16 on reply card

WORLD RADIO LABORATORIES, the world's largest distributor of amateur radio equipment, offers their 1955 catalog without cost to all interested persons. This booklet contains over 15,000 items pertaining to the fields of amateur and industrial radio, electronics, high fidelity, etc. Many World Radio parts and sections of manufactured equipment are now in use by MARS and other departments of defense. Inquiry should also be made as to special finance plan, requiring only 10% initial down payment. Catalog should be of interest to personnel of all military departments.

For more facts request No. 17 on reply card

GRAPHIC SYSTEMS. This New York firm invites men interested in efficient management to get things done with their Boardmaster Visual control which gives a graphic picture of your operations, spotlighted in color, preventing errors, saving time and money.

For more facts request No. 18 on reply card

LESTER B. KNIGHT & ASSOCIATES, INC. Experienced management Counsel and specialized services to Armed Forces Management is offered by Knight engineers. If your operation will benefit by highly specialized skills in financial management, paperwork management, management controls, or plant engineering, a Knight representative will call upon your inquiry.

For more facts request No. 19 on reply card

EQUIPTO DIVISION OF AURORA EQUIPMENT COMPANY—Manufacturers of factory and shop equipment for the past forty years, Equipto will send their free, illustrated catalogue, covering a wide variety of products, to interested Defense personnel.

For more facts request No. 20 on reply card

NORTH AMERICAN VAN LINES, INC.—This organization has "more agents in more cities than any other van line," quoting this leader in long-distance moving. When moving on change of station, specify North American for fast efficient transportation. Be prepared for a transfer, with the knowledge borrowed from experts.

For more facts request No. 21 on reply card

ARMED FORCES MANAGEMENT. Offers the latest comprehensive work on photographic motion analysis. If you want to keep up with developments, mail the coupon on Cover 3.

CLARK EQUIPMENT COMPANY. This firm's Industrial Truck Division offers the new Y-20 Scoop which the company claims will outperform anything in its field, dollar for dollar. The Y-20 Scoop has the shortest turning radius of any machine on the market, 71 inches, and plenty of "reach." It can easily dump into bins 86" high, and can climb a 14% grade fully loaded. Ask for a demonstration.

For more facts request No. 22 on reply card

CURTISS - WRIGHT CORPORATION. Makers of some of the world's finest aircraft engines, this firm reveals a hint of the power it packed into the Grumman F9F-9 "Tiger" with its J65 Jet. The J65 Jet develops higher power than its announced rating of 7220 lbs. thrust with 6% less fuel.

For more facts request No. 23 on reply card

DOUGLAS AVIATION. First production model of the U.S. Navy's new fighter, the Douglas F4D Skyray, surpassed the speed of sound during routine delivery flight, announces Douglas. Skyray is holder of the world's official F.A.I. sea-level speed record of 753.4 m.p.h. It is designed for interceptor duty and operates with ease from aircraft carriers.

For more facts request No. 24 on reply card

BORG EQUIPMENT DIVISION —THE GEORGE W. BORG CORPORATION, now offers fractional horsepower, totally enclosed motors, for recorders, instruments and timing devices. These synchronous and induction motors can be supplied with or without internal gear train.

For more facts request No. 25 on reply card

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GEMENT



Letters to the Editor

Dear Editor:

I agree with the advice given D.E.F. by J.B.S. that management must be sold in many instances not only to your superiors but also to those who are actually performing the job. In other words, it is possible to get those persons doing the job to assist you with continual recommendations to the top, to try new ideas.

B.B.K.

Dear Editor:

Please send me another copy of your April issue. For some reason mine was not delivered, and I enjoy knowing what is going on within the services. How about more information on "What the Army is doing toward management im-

provement," and also how about more ads on management improvement literature?

J.D.G.

Dear Editor:

I have certainly enjoyed the information in your "Products Section." As a Base Engineer the information has materially assisted me in purchasing.

P.V.S.

Dear Editor:

Congratulations on your very fine magazine, ARMED FORCES MANAGEMENT. Your excellent articles are read by all employees of the Comptroller Department here at Naval Ammunition Depot, Hawthorne, Nevada. G.A.R.

Engineers' Research and Development Laboratories. Made of aluminum 62S and pure titanium, it is designed to accommodate jobs requiring racks of a wide variety of sizes and shapes. Great savings have been realized in money, time, materials and storage space by the use of three 6½" x 25" racks at the Laboratories, who previously required as many as 60 racks of different dimensions.

Camp Lejeune, North Carolina. Major General Alfred H. Noble, Commanding General, recently presented awards to four Camp Lejeune employees for beneficial suggestions. Mr. Ben W. McCoy received \$85 for manufacturing a baking oven for refrigerator units from surveyed material. Mr. William F. Southall, Ordnance Service Battalion was presented an \$85 award for developing a safety pallet for handling bulk material. Edward O. Cotton from the same organization received a \$50 award for developing a test stand for cross drive transmissions in M47 and M48 tanks. A \$20 award was given to Gertrude C. Smith, reclamation department, for a new sewing handbook.

Fort Lesley J. McNair, Washington, D.C. Colonel George W. Gibbs, Commanding Officer, recently presented Mr. Buel W. Simcox with a \$60 award for his suggestion to change the heating of building water tanks. Total tangible benefits amount to \$100 per month. Mr. William V. Moore received an award of \$50 for his suggestion recommending a layout change in the carpentry shop.

Utah General Depot, Ogden, Utah. Top winners in the Incentive Awards Program are Alonzo T. Barrett, who received \$475 for his suggested method of reclaiming certain canned food for the Navy; Newell H. Thurgood, who netted \$250 for an accounting change; and Mr. Morris G. Chadick, \$235 for a suggestion to improve the manufacture of fiberboard cleated crates.

Reese Air Force Base, Lubbock, Texas. Recent winner of a \$90 Base Incentive Award, Jack M. House, Foreman at the 3505th Field Maintenance Squadron sheet metal shop, gave a luncheon for 34 civilian and military personnel of the sheet metal shop recently. He paid for the luncheon with his award.

What's NEW in Suggestions?

Naval Air Station, Hutchinson, Kansas. CPO J. J. McCarter, the Station's "idea man," has worked up a new one in the form of a KILL-FROST SPRAY RIG. The trailer which supports the equipment is an old, four-wheeled bomb cart, towed by a mechanical mule. The tank was recovered from scrap and the remainder from surplus material. A gas engine compressor furnishes the power, and defrosting fluid is forced through a flexible hose at approximately twenty-five pounds per square inch.

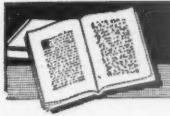
General Motors Corporation. During the year 1954, 192,030 suggestions were submitted. Of these 46,995 were put into effect and their originators received a total of \$2,467,513.83. Maximum award at General Motors is \$2500. During 1954, 74 maximum awards were made.

Langley Air Force Base, Vir-

ginia. M/Sgt. Francis V. Limandri of the 405th Maintenance Squadron recently developed a Technical Order Compliance Data Record System that has proven so effective many bases and commands are adopting it.

47th Fighter Interceptor Squadron, Niagara Falls, New York. Sergeant William E. Schrock, armament inspector, has developed a new device for checking the fire control system on the F86D. The job previously required four hours and involved dismantling the rocket launcher. The new idea reduced this time to 10 minutes, and will allow more frequent checks and increased safety.

Fort Belvoir, Virginia. A versatile rack for anodizing aluminum and magnesium alloys has been designed and fabricated by Sidney Levine and George J. Esseff of the Materials Branch at the Corps of



Book Reviews

by D. D. Corrigan

Dear Sir

"MODERN BUSINESS ENGLISH," by A. Charles Babenroth and Charles Chandler Parkhurst (Prentice-Hall, 647 pages, \$5.95).

My dear Mr. John Smith, Esquire:

Acknowledging your esteemed letter, contents carefully noted, in reply we wish to state that according to our records, we wish to advise and assure you at this time, and upon investigation, we take this opportunity to inform you that shipment will be made in due course.

We take great pleasure in enclosing herewith, a price list of our new line.

If shipment is not received soon, please advise at your convenience.

Hoping to hear from you soon, and trusting this will be satisfactory, we remain,

Faithfully yours,

The writer of this letter needs "Modern Business English." Clear communication in business promotes good human relations. A letter represents the writer.

Informal Study

"AMERICAN IN RUSSIA," by Harrison E. Salisbury (Harper, 328 pages, \$4.00).

Mr. Salisbury was the New York Times' Moscow correspondent for five years. His reporting makes vivid reading and serves as a good guide to understanding the complexities of the Soviet Union.

"WILLIAM SHAKESPEARE," by John Masefield (Macmillan, \$1.75).

England's poet laureate gives the layman an informal study of Shakespeare, with an introductory sketch of Shakespeare and his environment, a discussion of the plays, and a section devoted to poetry.

Prisoner of War Memoirs

"RETURN TICKET," by Anthony Deane-Drummond (J. B. Lippincott, 254 pages, \$3.50).

"Escape" stories have deluged the book market since the end of World War II, and have created a new type of literature. These books have their own followers as have detective, western, science-fiction, historical novels, and the like. The similarities are suspense, adventure, and intrigue. The difference is that "escape" stories are true—perhaps exaggerated a little for heightened tension—but fundamentally based on actual fact.

Anthony Deane-Drummond was a brave and daring young British parachutist, who make no attempt to hide his courage. But he gets by with his self-esteem because he obviously was very brave. It isn't everyone who would escape from an Italian prison camp, walk into the nearest railway station, and try to buy a ticket, hardly knowing a word of Italian, and actually get by with it. Or hide for thirteen days and nights in a cupboard of a room where the Germans were interrogating prisoners. He existed on a one-pound tin of lard and half a loaf of bread, in such cramped quarters he could not sit down.

This officer was among the first parachutists to land in Italy in 1941. After the mission was accomplished, Deane-Drummond was taken prisoner. Twice, he tried to escape, and each time reached the Swiss frontier. The second time he was successful in crossing, and travelled through occupied France to return to England.

He joined the First Airborne Division and was dropped in the famous Arnhem battlefield. He was taken prisoner for the second time, and escaped by staying in the cupboard for thirteen days. On escaping he was assisted by dauntless Dutch families and returned to the British lines.

As for being a writer, Deane-Drummond does a passable job considering he is not attempting to compete with Dickens or Hemingway. However, it would appear that anything he attempts is successful. Adventure happens on

page one and keeps the reader engrossed until the last page is regretfully reached.

Looking Ahead

"WHERE TO RETIRE ON A SMALL INCOME," by Norman D. Ford (Harian Publications, 72 pages, \$1.00).

Here is a book dedicated to the principle that a person should retire while young enough to enjoy it. Members of the Armed Forces fit this category, and often have no permanent home in which to retire. Valuable suggestions are given to those seeking a place to enjoy life when the financially productive years are over.

Mr. Ford travelled throughout the United States and the offshore islands collecting data. He talked with people who had retired to learn their experiences. Real estate men gave the picture of rental accommodations, and prices and availability of houses. Bankers were questioned as to the finances of the community and the cost of living. Cultural facilities, sports, and recreational aspects were covered.

Seven regions were found by the author to be best suited for low cost retirement, and he advises interested readers to visit the section that appeals to them the most before coming to a decision. The seven regions are: New England, the Atlantic Seaboard, Florida, Pacific Northwest, California, the Ozarks, and the inland Southwest Province.

Claims are made by Mr. Ford that a couple living on a monthly income of \$160 could live in Florida and every second or third year vacation in Europe for two months. For modest and fairly comfortable living in St. Petersburg, it is recommended a couple must have \$110 a month and own their own house. These statements sound rather fantastic and unrealistic and should be taken with a few grains of salt, several question marks, and complete investigation before packing a suitcase.

Suggested regions are outlined for people needing certain climates for health reasons. The Southwest and Southern California are extolled for respiratory disorders. Florida and the Southwest are cited for cases of pneumonia and pleur-

sy. Also consideration is given to those desiring part time employment or semi-retirement.

An example of a good low cost retirement city is Doniphan, Missouri.

"Doniphan. Pop. 1,650. Vigorous, little industrial town on the Current River. Its mild climate, low taxes, and low cost of living, as well as its good hunting and fishing and varied athletics, make it attractive to retired railroad, Army, Navy, postal and civil service men and women. Gardening is good if watering facilities are installed for later maturing vegetables. Job opportunities are not plentiful, but there is a good selection of new business needs. TV: 3 channels. Lib. Excellent community spirit is shown in its many clubs and organizations. Rentals range from \$25-\$35 mo., and real estate, somewhat scarce, from \$2,500-\$4,000."

Sound General Quarters

"THE GOOD SHEPHERD," by C. S. Forester (Little, Brown, 310 pages, \$3.95).

Mr. Forester is a master story teller, who writes in the classic tradition. His tales of Captain Horatio Hornblower are world famous and hailed by sea-faring men as well as those who just like to read a good yarn.

"The Good Shepherd," is Commander George Krause, herding his convoy of thirty-seven merchant ships through a U-boat wolf pack, assisted by only four destroyers. The great strain of spiritual and physical needs take their toll of Krause. The maneuvering commands and navy talk may be confusing to the novice, but understanding soon follows. Technically perfect are the orders given and received. Forester went to sea in 1943 with the navy, and was assisted in this story by Vice Admiral Ralph Christie and Commander J. D. P. Hodapp.

Repondez S'il Vous Plait

"DEVELOPING MANAGEMENT ABILITY," by Earl G. Planty and J. Thomas Freeston (Ronald Press, 447 pages, \$7.00).

"What is the Difference Between Induction and Orientation?"

"What is the Meaning of Observational Assignment?"

"What Should the Leader of Staff Meetings Avoid if he Wants to Encourage Participation and Growth?"

"Should a Man's Immediate Superior Appraise Him?"

The above four questions and 566 more are skillfully and judicially answered. The questions were actually asked the authors by men in business who were anxious for improvement and development in their companies. The Guided Experience Method is discussed for the first time. The index is excellent and complete, as is necessary in a book of this type.

Specific problems are analyzed as well as modern theory. The book is organized so that a reader may progress from chapter to chapter, or refer to special problems. Continuity is established, although each question is self-contained.

Earl G. Planty is Executive Counselor for Johnson and Johnson, makers of surgical dressings. Training Director, university lec-

tures, and leading management and training conferences qualifies him in the field of personnel development.

J. Thomas Freeston was a civilian training specialist for the U.S. Army Air Force before he entered industry. Now he is engaged as Personnel Director for Ethicon, Inc., and lectures at the Institute of Management and Labor Relations at Rutgers University.

The combined talents of these two men prove a worthy addition to the library of men interested in understanding and developing management ability.

Recommended Reading

"THE INFLUENCE OF FORCE IN FOREIGN RELATIONS," by Capt. W. D. Puleston, U.S.N., Ret. (D. Van Nostrand Company, Inc., 254 pages, \$4.50).

This distinguished officer writes with dexterity and skill. He offers Naval history and new thoughts on the use of force as the best means of maintaining peace.

"CHIANG KAI-SHEK," by Emily Hahn (Doubleday, 382 pages, \$5.00).

The first popular biography of Chiang Kai-shek that presents him as a person; lonely, betrayed, obstinate, and sometimes ruthless.

"PERSONNEL RELATIONS," by Arthur M. Whitehall, Jr. (McGraw-Hill, 526 pages, \$6.00).

Direction of human resources, planning, management skills, and relationships are compactly presented.

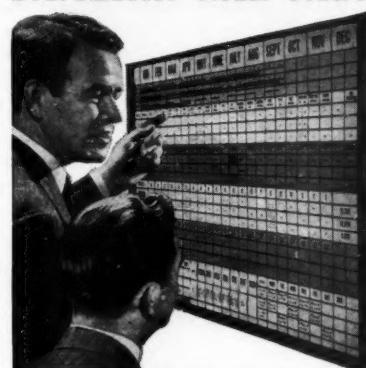
"THE HIDDEN RIVER," by Storm Jameson (Harper, 244 pages, \$3.00).

Fiction at its best. The events that occur when a group of people acquainted in Occupied France meet again in the setting of a country house on the Loire.

"SYMPOSIUM ON FATIGUE," edited by W. F. Floyd and A. T. Welford (John de Graff, Inc., 196 pages, \$4.00).

The Ergonomics Research Society was founded in England to investigate the designing of machines as related to the human use. Engineers, anatomists, and physiologists show in this book the result of their findings on the fatigue of workers.

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Clark Equipment Company..... Page 1

This firm's Industrial Truck Division offers their new Y-20 Scoop which, they claim, will outperform anything in its field, dollar for dollar.

Curtiss-Wright Corporation Page 2

Makers of some of the world's finest aircraft engines, this firm hints at some of the power it packed into the Grumman F9F-9 "Tiger" with its J65 Jet.

Douglas Aviation Second Cover

This leading aircraft manufacturing company proudly relates that the first production model of their new navy fighter, the Douglas F4D Skyray, surpassed the speed of sound during routine delivery flight.

Equipto Division of Aurora Equipment Company..... Page 19

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Graphic Systems..... Page 43

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World Radio Laboratories..... Page 37

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Mack Trucks, Incorporated have taken the first major step in a long-range program of diversification. The recently announced purchase

of White Industries, Incorporated and Radio Sonic Corporation, makers of electronics for aviation, industrial and military use, will be operated as the Electronics Division of Mack.

ABOUT THE AUTHOR

A photographic career that dates back to the early twenties has given John H. Waddell a background that justifies characterization as a dean of Scientific Photography. His experiences in microcopying, x-ray, color photography, photographic instrumentation, high-speed motion picture photography, coupled with collaboration in developing a popular method of processing sound from film, are incorporated in his work *Photographic Motion Analysis*.

John H. Waddell

high-speed motion picture photography, coupled with collaboration in developing a popular method of processing sound from film, are incorporated in his work *Photographic Motion Analysis*.

He was the first person to make underwater high-speed motion pictures in daylight at 4000 frames per second; he made the first full color pictures, in daylight, of a missile take-off. As a technical representative and consultant to the Army Air Forces, the author took the first high-speed color pictures of an atomic bomb explosion and, in 1952, he took the first high-speed color movies of the human heart in action—at 1000 pictures per second, motion was "frozen" to show every phase of each heart beat.

John H. Waddell's knowledge and experience finds him serving as consultant to the Army Air Forces, Navy, Ordnance, Bureau of Standards, Institute of Medical Research in Los Angeles, and other technical organizations.

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